NOVEMBER 24, 1952

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

EXPENDITURES

Tooling and Styling New Models:
$200,000,000

How a New Model Is Born...

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Fast Motor Service Wherever You Are

"Certified"

Factory approved motor service in every industrial area from 97 Allis-Chalmers Certified Service Shops.

ALABAMA
Birmingham—Elec. Repair & Serv. Co.
Montgomery—Standard Electric

ARIZONA
Bisbee—Copper Electric Co. Inc.
Phoenix—Daley Electric Company

CALIFORNIA
San Diego—Calif. Elec. Works
Los Angeles—Larsen Hogue Elec. Co.
Oakland—T. L. Rosenberg Co.
San Francisco—Weidenthal Gastiner

COLORADO
Denver—Baker Electric Company

CONNECTICUT
Hartford—Charles H. Leppert
Waterbury—Elec. Motor Repair Co.

FLORIDA
Jacksonville—Turner Electric Works
Miami—Peninsular Armature Works
Tampa—Tampa Armature Works

GEORGIA
Albany—Georgia Electric Co.
Atlanta—Bearden Thompson Elec. Co.
Columbus—Smith Gray Electric Co.

ILLINOIS
Chicago—Chicago Electric Co.
Marion—Giles Armature & Elec. Wks.
Mt. Vernon—Dowzer Electric

INDIANA
Indianapolis—Scherer Electric Co.
Evansville—Evansville Elec. & Mfg. Co.

IOWA
Sioux City—Smith Elec. & Supply Co.

KANSAS
Salina—Cent. Kans. Elec. Mach. Co.
Wichita—Tarrant Electric Mach. Co.

LOUISIANA
New Orleans—Industrial Elec., Inc.
Shreveport—Shreveport Arm. & Elec.

MAINE
Brewer—Stanley J. Leen Co.

MARYLAND
Baltimore—Keystone Electric Co.

MASSACHUSETTS
Lawrence—Roland B. Glines Co.
Roslindale—Ranney Electric Motors
Springfield—Elec. Motor Repair Co.

MICHIGAN
Detroit—Stecker Electric Company
Grand Rapids—Grand Rapids Ind. Elec.
Saginaw—Banning Elect. Prod. Corp.

MINNESOTA
Duluth—Mielke Electric Works
Minneapolis—Parsons Elec. Co.

MISSISSIPPI
Vicksburg—Ludke Electric Co., Inc.

MISSOURI
Kansas City—Boese-Hilburn Elec. Co.
St. Louis—French-Gerleman Elec. Co.
Springfield—Springfield Elec. Serv.

NEBRASKA
Omaha—Omaha Electrical Works

NEW HAMPSHIRE
Concord—A. S. Tracy

NEW JERSEY
Atlantic City—Charles A. Buckley
Paterson—Elec. Services Repair Co.
Trenton—Lockwood Elec. Motor Serv.

NEW MEXICO
Albuquerque—Electric Motor Company
Powell Electric Co.

NEW YORK
Buffalo—Robertson Electric Co.
Jamestown—A. E. Westburgh
Mt. Vernon—H. A. Schreck, Inc.
New York—Consol. Elec. Motor Co.
Rochester—Vanderlinde Elec. Corp.
Utica—Mather, Evans & Diehl Co.
Watertown—Watertown Elec., Inc.

NORTH CAROLINA
Charlotte—Southern Elec. Service Co.
Greensboro—Southern Elec. Serv. Co.
Rocky Mount—Hammond Elec. Co.

OHIO
Cincinnati—Cincinnati Elec. Equip. Electric Service Co.
Akron—A C Supply Co.
Toledo—Ramanoff Elec. Motor Serv.
Youngstown—Winkle Electric Co.

OKLAHOMA
Miami—Miami Armature Works
Oklahoma City—Southwest Elec. Co.
Tulsa—Smith Milligan Electric Co.

OREGON
Eugene—Kalen Electric & Mach. Co.
Portland—Milwaukee Mach. Co.

PENNSYLVANIA
Johnstown—Universal Elec. Mfg. Co.
Osceola Mills—Mid State Elec. Eng. Co.
Philadelphia—Elec. App. & Repair Co.
Pittsburgh—Penn. Elec. Coil Corp.
York—Industrial Electric Company

SOUTH CAROLINA
Greenville—Southern Elec. Serv. Co.
Spartanburg—Southern Elec. Serv. Co.

SOUTH DAKOTA
Sioux Falls—Electric Motor Repair

TENNESSEE
Columbia—Middle Tenn. Arm. Wks.
LaFollette—Standard Arm. Works
Memphis—Indus. Elec. & Supply Co.

TEXAS
Amarillo—G. E. Jones Elec. Co.
Beaumont—Elec. Mach. & Repair
Dallas—Industrial Elec. Equipment Co.
El Paso—B & M Machinery Co.
Fort Worth—Central Electric Co.
Houston—Ray A. Berentz Co.
Sweetwater—Sweetwater Electric Co.

UTAH
Salt Lake City—Diamond Electric

VIRGINIA
Richmond—Wingfield & Hundley
Roanoke—Virginia Armature Co.

WASHINGTON
Spokane—Lee F. Austin Company

WEST VIRGINIA
Charleston—Charleston Elec. Supply
Fairmont—Central Elec. Repair Co.

WISCONSIN
Baraboo—Utility Transformer Equip. Co.
Green Bay—Beemster Electric Co.
Milwaukee—Dietz Electric Co.
Wausau—Electric Motor Service
Wisconsin Rapids—Staub's Elec. Wks.

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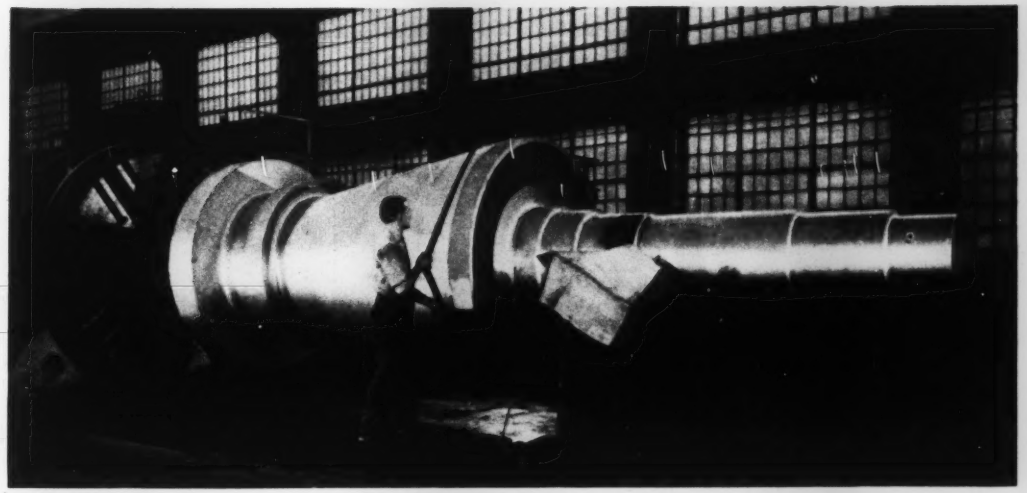


There are GIANTS in our family

(AND LITTLE FELLOWS, TOO)

Probably very few people have met the entire Bethlehem family of forgings. It's so big, and includes such a multitude of sizes and types, that the family tree is really something.

Bethlehem forges giants like the turbine rotor shown here. But big as it is, this is by no means the largest forging we ever made. The steel rolls are husky specimens too. On the other hand, that little drop forging is one of the kindergarten crop—size-wise, anyhow. In quality, it's on a par with its bigger Bethlehem brothers.

You can count on Bethlehem for almost everything in forgings—pieces ranging in weight from a few ounces to many tons. What's more, we can ship them in any condition you want—untreated or heat-treated, as-forged, rough-machined, or beautifully finish-machined.

When forgings are your problem, call or write Bethlehem. Your order will be capably handled, delivered with every specification fully met.

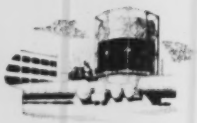
BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Philgas*

FOR INDUSTRIES



FOR UTILITIES

A Clean-Burning, Uniform LP-Gas!

RELIABILITY: You can depend on Philgas, a top-quality Phillips product, for uniform gravity and high thermal value. Exceptionally clean, too . . . free from harmful contaminants.

EASE OF USE: Automatic Philgas systems assure constant furnace temperatures and atmospheres . . . reduce operational worries . . . cut down on overhead.

RECORD: Philgas is being used successfully by many of the nation's leading manufacturers for almost any operation where a uniform, clean, easily-controlled heat is needed. Many progressive utilities, too, are supplementing their output of natural or manufactured gas with dependable Philgas. It's America's largest selling brand of LP-Gas!

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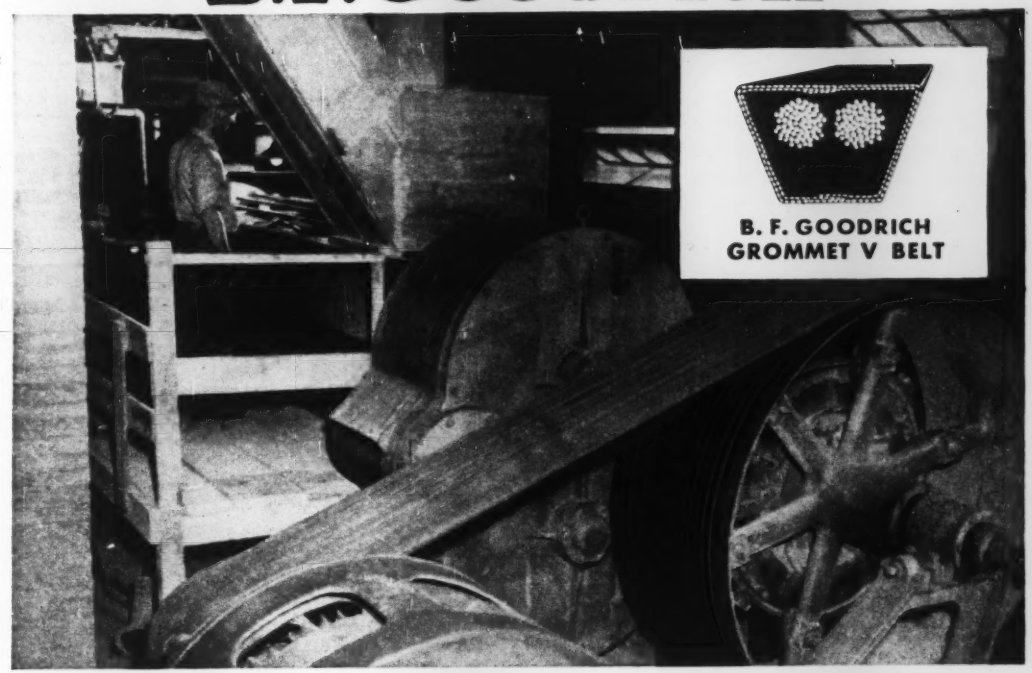
RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER



Where B.F.Goodrich grommet belts have outlasted others 8 to 1

B. F. Goodrich grommet V belts cut costs 20 to 50%

EACH time this machine is started the belts that drive it take a beating. The shock, combined with the heavy pulling load and high speed, caused the first set of V belts used on this drive to fail in only 6 months. Something exceptional was needed, so B. F. Goodrich grommet V belts were installed. That was over 4 years ago, and they're still in use. In fact, the company superintendent says it looks as though this same set of grommet V belts will operate another 10 years. Here's why B. F. Goodrich grommet belts outperform ordinary belts:

No cord ends — A grommet is endless, made by winding heavy cord on itself to form an endless loop. It has no overlapping ends. Because most of the failures in ordinary V belts occur in the region where cords overlap, the endless cord section in a grommet V belt eliminates such failures.

Concentrated cord strength — All of the cord material in a B. F. Goodrich grommet belt is *concentrated* in twin grommets, positioned close to the driving faces of the pulley. There are no layers of cords to rub against one another and generate heat; cord and adhesion failures are reduced. And grommet V belts stretch less — only ⅓ as much, on an average, as ordinary V belts.

Better grip, less slip — Grommet V belts have more rubber in relation to belt size. Without any stiff overlap, they're more flexible, grip pulleys better. Size for size, grommet belts give ⅓ more gripping power, pull heavier loads with a higher safety factor. Because there is less slip, there is also less surface wear.

They cost no more — Grommet V belts cut costs because they last longer, increase production because machines keep running with fewer interruptions, reduce maintenance costs because they need less attention, yet they cost not one cent more. Available in C, D, and E sections. But remember, only B. F. Goodrich makes the grommet V belt (U. S. Patent No. 2,233,294), so to get all these savings, call in your local BFG distributor the next time you need V belts, or write *The B.F.Goodrich Company, Industrial & General Products Division, Akron, Ohio.* (Available in Canada)

Grommet V-Belts BY
B.F.Goodrich
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For better High Pressure Control Mechanisms

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This Week in Metalworking

STEEL

Vol. 131 No. 21 Nov. 24, 1952

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PLA-TANK®

and They're Not All Alike!

Naturally we've had imitators. Every good idea has. We're proud that PLA-TANK is the pioneer name in the resin-bonded Fiberglas® tank field and hundreds upon hundreds of our customers are happy with the service they're getting from their PLA-TANK products.

Occasionally some one succumbs to the lure of a lower price or a glossy paint job or a smoother finish and passes up PLA-TANK'S superior features. When they have a failure they condemn plastic tanks as a whole.

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Every unit is made individually by custom layup molding. This personal attention to each square inch of surface is the only way to guard against weakening dry spots and brittle resin buildups.

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Tanks are built to basic hydraulic principles of design. Reinforcing ribs are horizontal to prevent deflection. Corners are built up triple, edges double for added strength and longer service.

Over 150 standard sizes in rectangular and cylindrical tanks are available. Write for size, price and data sheets.

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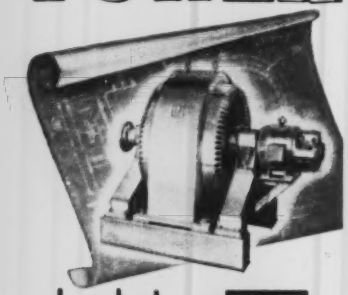
for
custom-engineered
POWER



look to... EP

Since 1909, the job of The Electric Products Company has been to create and develop special electrical rotating equipment . . . motors and generators to do existing jobs better or to reach into new fields to do jobs that couldn't be done before. The natural "by-product" of our more than 40 years of specialization is that you get equipment designed and built to the exact requirements of your application . . . equipment that has greater dependability, longer life and that requires less maintenance.

Send in the coupon below for detailed information about our Custom-Engineered synchronous motors and generators . . . d-c motors and generators . . . induction motors . . . battery chargers . . . frequency changers.

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Behind the Scenes...

Just Out

We just got our 1953 edition of *The Old Farmer's Almanac*. It's the 161st anniversary of the book. We're particularly glad to have this one because we lost the last one and have been unable to check a reliable source for weather information. Now we're back in the fold.

Beside the recipes, farming data, medical information etc., this weather data towers majestically in importance to us. With only a peek, we can be prophets. All this reminds us. Cancel any plans for garden parties for the month of March, next year. It's going to be a stormy month all through with at least one blow big enough to put the hat-makers on three shifts.

Mags to Britches

Robert Hall, our editor in charge down in the Pittsburgh area, is having heavy competition with another Robert Hall, a clothier. Robert Hall, the clothier, is putting on an aggressive advertising campaign now that features numerous spot commercials on the radio every day. As a result, Robert Hall, the editor, has to explain carefully wherever he goes just who he is. Nevertheless, a new nickname has been attached to our man, who now becomes Robert (Low Overhead) Hall, the editor.

Hold Still

Down at Timken Roller Bearing Co. in Canton, O., they have a lab which they thought was isolated from outside vibration. It has a concrete floor from 12 to 18 inches thick and ½-inch of insulation between the walls and around each column.

The other day Hans Linquist was in the lab adjusting a precision grinder used to grind gages to within ten millionths of an inch. Hans was mystified when the bubble in a precision level moved 0.0014-inch. He checked with neighboring plants and found they were not carrying on any unusually heavy work which would set up vibrations.

That evening he heard in a news release that there had been an earthquake north of the Japanese Islands, 5000 air miles away. Next morning he checked with a Cleveland university and they had a seismograph read-out of the quake at 12:09 P. M.—exactly the time Hans got the bubble shakes in the lab. Interesting note is that this typewriter had the shakes the same day. Just shows you what precision instruments will pick up.

More Specials

In keeping with our continuing intention to have you informed on all important special "weeks" we announce that this is Cage Bird Week and Latin America Week—a double barrelled cause for hilarious celebrations. STEEL celebrates the latter starting on p. 79.

Anchors Aweigh

We see in the *New England News Letter* that the selectmen in Wellfleet, Mass., have arranged to have the tower clock in the church ring according to the ship's system of "bells." That makes it 8 blows at 4, 8, and 12 o'clock in both halves of the day.

That's only one step away from calling the Mayor "Admiral". Then after titles are assigned to all the officials, the police become SPs and the city is under way. Keep a close watch on the courthouse. She's under way with no way-on and the rudder's at half mast, an obvious signal of distress. (You can't snow us, we've seen movies!)

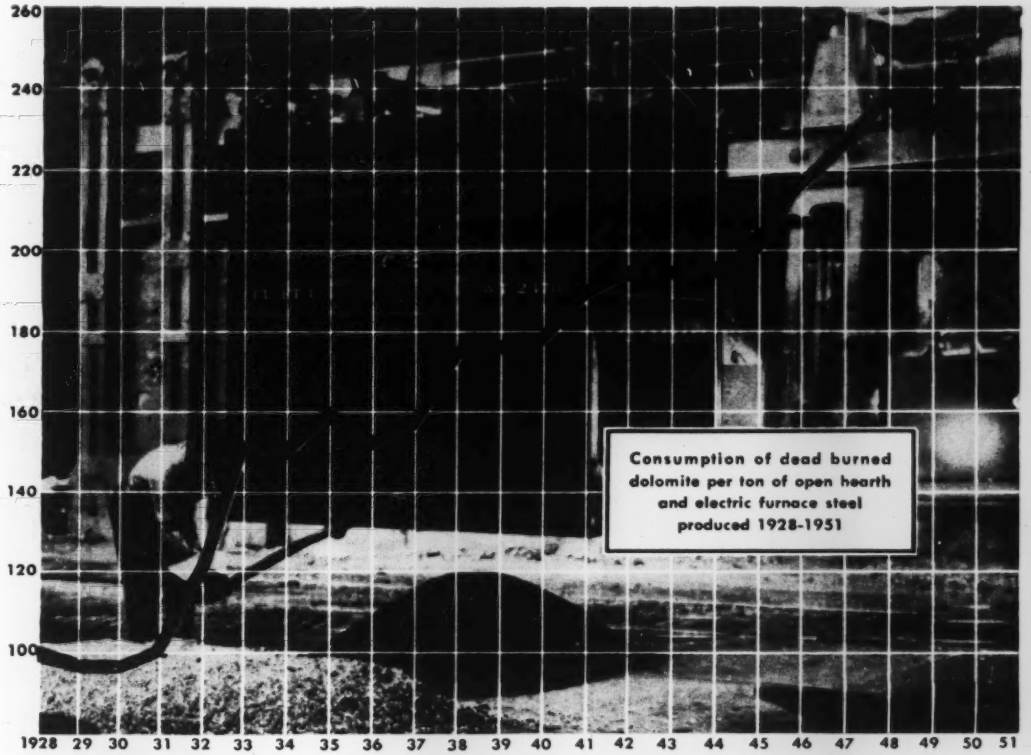
Puzzle Corner

The answer to the problem in the Nov. 10 issue comes to 4107 pages in the book. First across the finish line with that one were: Ralph Pappenheimer, Specialty Device Co., G. W. Frederick, Republic Steel Corp., Bob Knop, Wolverine Tool Co. and L. D. Rice, Timken Roller Bearing Co.

This one's for the philanthropists in the crowd on a limited budget. If I were to give 7 cents to each of the beggars at my door, I would have 24 cents left. I lack 32 cents of being able to give them 9 cents apiece. How many beggars are there, and how much money do I have?

Shrdlu

(Metalworking Outlook—Page 61)



calcined dolomite vs. dead burned dolomite

THE price of calcined dolomite approaches that of dead burned dolomite. But in terms of effectiveness as a hearth refractory, calcined dolomite has most of the shortcomings of raw dolomite. However, it lacks the effectiveness of this low priced material for routine drying of bottom.

Calcined dolomite is often called "single burned", just as dead burned dolomite is referred to as "double burned". This outdated nomenclature originated years ago when raw dolomite was first calcined (fired to a temperature high enough to drive off CO_2) and then refired at higher temperatures to obtain dense, thoroughly shrunk granules containing essentially crystalline magnesia and lime.

Calcined dolomite, with a density of 60 to 80 pounds as opposed to 120 pounds per cubic foot for dead burned dolomite, has a high porosity. It reacts rapidly with atmospheric moisture and carbon dioxide. Thus, slaking in transit and storage causes excessive fines. Fines not only pose a dust problem for furnace personnel, but when swept through the furnace by combustion gases, result in damage to all refractories, both below and above floor level.

Lacking density and an integral coalescing agent, calcined dolomite is highly vulnerable to attack during the initial stage of the heat. Calcine thus removed increases slag volume. Magnesia from the calcine leads to viscous slags which take manganese and iron oxides into solid solution, rendering them ineffectual in their important role of refining agents.

Today few steel plants use calcined dolomite. Thus, practice proves the reasoning of science—in increasing consumption of dead burned dolomite.

A pioneer in the manufacture of dead burned dolomite, Basic Refractories Incorporated fulfills its responsibility as a supplier of this essential hearth refractory through a continuing program of product research and quality control and by anticipating, through increased and improved production facilities, the ever expanding requirements of the steel industry for Magnefer and Syndolag.

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Basic Refractories Incorporated

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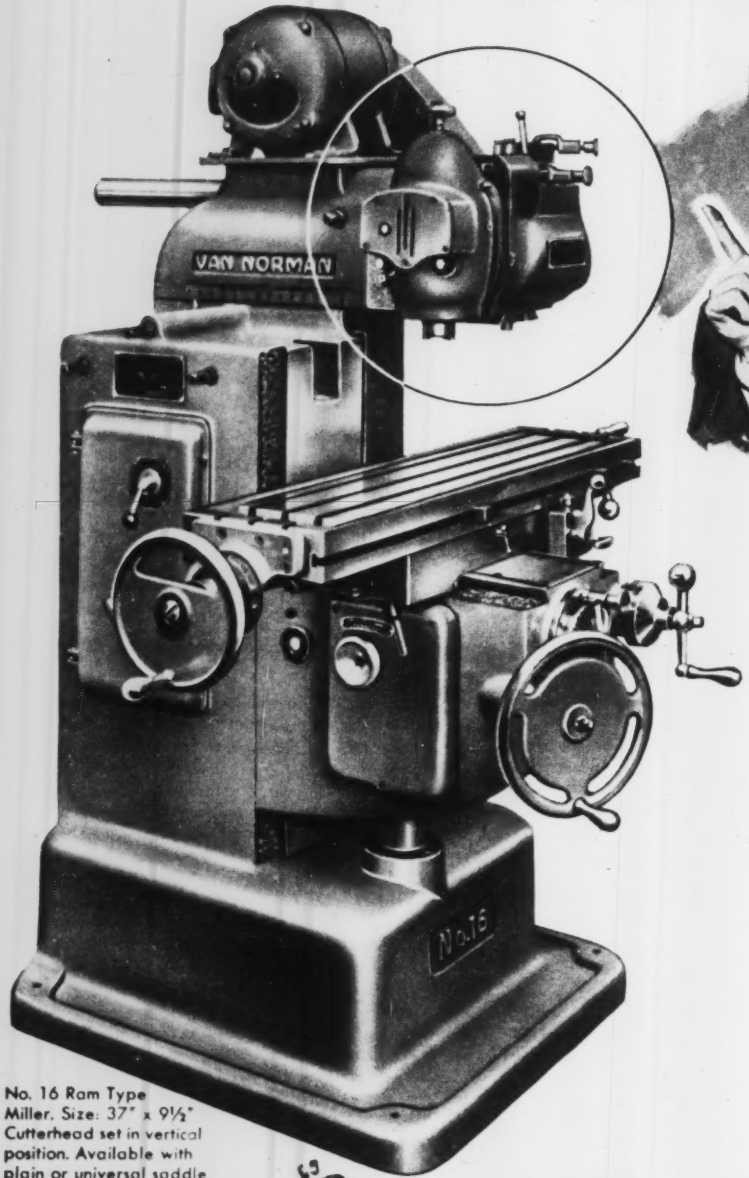
Exclusive Agents in Canada: REFRACTORIES ENGINEERING AND SUPPLIES, LTD., Hamilton and Montreal

"See what the



No. 16 Ram Type Miller. Size: 37" x 9½" Cutterhead set in vertical position. Available with plain or universal saddle

"It pays to Van Normanize"

Adjustable Cutterhead

Can Do For You...

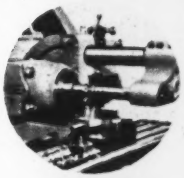
...and you will buy VAN NORMAN Ram Type Millers"

Van Norman Ram Type Millers give you every advantage for reducing milling costs. The adjustable cutterhead, which permits vertical, horizontal or angular milling on one machine, cuts idle machine time by as much as 50%. The movable ram plus the saddle cross feed increases the work range and capacity of these millers . . . enables you to handle larger work pieces with ease.

There is no waiting for single purpose machines because practically all milling operations can be accomplished on one Van Norman Ram Type Miller.

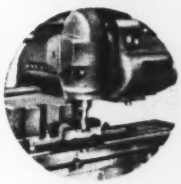
Whether it is for tool room, production line, machine shop, tool and die shop, or laboratory work, Van Norman Ram Type Millers will increase your production and cut costs.

Here's how one Van Norman Ram Type Miller does the work of three single-purpose machines.



HORIZONTAL MILLING

With the cutterhead locked in horizontal position, the Van Norman Ram Type Miller is used for horizontal milling operation. Hardened stop set at the factory assures positive 0° setting.



VERTICAL MILLING

The illustration above shows the Van Norman Ram Type Miller as it is used for a vertical milling operation. Permanently fixed hardened stop permits easy, accurate positioning of the cutterhead at 90°.

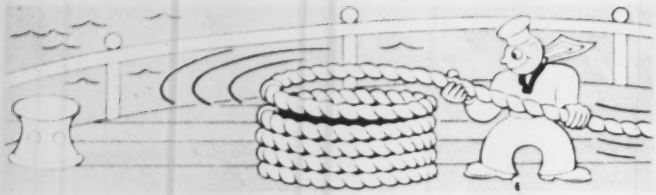
ANGULAR MILLING

Here the adjustable cutterhead is set at 45° angular milling position. Horizontal, vertical or angular milling. All are easily performed on the Van Norman Ram Type Miller.

Van Norman Ram Type Millers are available in 6 basic models — No. 12, Table: 37½" x 9¾"; No. 16 Table: 37" x 9½"; No. 22L Table: 45" x 10"; No. 26 Table: 58" x 13"; No. 36 Table: 64" x 14"; No. 38 Table: 64" x 14".

VAN NORMAN COMPANY

SPRINGFIELD 7, MASSACHUSETTS

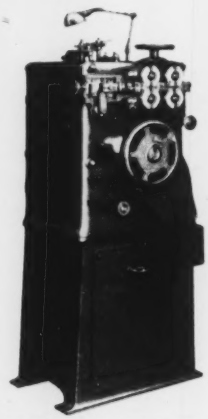


For a spring with accurate coiling see the man with a

Versatile Torrington Spring Coiler

In spring coiling, the words "Torrington" and "Versatile" are synonymous! When you desire springs produced to meet exacting requirements, just call the professional springmaker who has a Torrington coiler. He's the man who can fill your needs with accuracy, speed and economy. On special springs, our sales department will gladly assist you in finding a source of supply, or help your springmaker devise just the right tooling to produce it.

Torrington's 14 different Spring Coilers cover a range of wire diameters from .003" to .750"



MODEL W-11 SPRING COILER

Wire diam. range: .015" to .072". Length per spring: 0" to 42". O. D. Coil Range: 3/32" to 19/16". Produces 23 to 190 springs per minute with variable speed drive. Extra wire feed gears, torsion, other attachments available.

NOW... Spring Makers and Users can get the same answers with The TORRINGTON SPRING TESTER

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The TORRINGTON MANUFACTURING COMPANY
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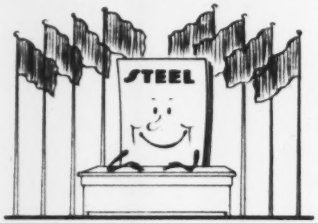
LETTERS TO THE EDITORS

French Process Explained



In the Sept. 15 issue of STEEL (p. 91) is a news item titled "More Extruded Capacity" in which is mentioned "glass lubrication".

Where can we find more information about this material.

William H. Adams
steel flow division
Great Lakes Steel Corp.
Detroit

• *Glass lubrication as mentioned in that item refers specifically to the Ugine-Sejournet process for the hot extrusion of steel. A copy of the first complete description of the French process ("New Method Makes Stainless Extrusion Practical," STEEL, June 2, p. 92) is on the way to you.—ED.*

Progress Story Proves Popular

The article entitled "Lubricants Must Survive Rough Treatment" (Oct. 13, p. 228) was most interesting.

We appreciate the fine manner in which this article was put forth. So much so that we are taking the liberty of asking you for tear sheets of this article to distribute to our representatives. We would like to have about 30 if available.

J. A. Rigby
vice president, engineering-sales
Brooks Oil Co.
Pittsburgh

• *They're being sent.—ED.*

Small Grinder with Big Pull

In your issue of Aug. 25 there was an article on coated abrasives. We noted on page 97, in the middle picture, a small swing grinder made by "Newton". Could you please advise us the full name and address of the supplier of this grinder.

D. H. Cross
manager of manufacturing
Dominion Engineering Works Ltd.
Montreal, Canada

• *That grinder is made by the Grinding & Polishing Machinery Corp., Indianapolis.—ED.*

Sell Out for Plant Tours

In going through the Aug. 11 issue of STEEL we were very much interested in the article "Companies Seek Company: Plant Tours Pay Off" (p. 66).

The Naval Ordnance Laboratory is a relatively new installation of the Navy and as such attracts a great deal of

Continued on following page

J&L OTISCOLOY
HIGH STRENGTH STEEL
Helps Make Friends for Penn Body Division of Hockensmith Corporation

J&L STEEL

Rock from Penn-Lincoln Parkway job drops into Robinson Company truck. J&L Otiscoloy body members and J&L heat-treated Jalloy plate bed floor assure long truck body service life.

E. F. Robinson Co. Reports Otiscoloy Truck Bodies Increased Payloads, Gave Longer Service Life with Lower Maintenance Costs

Mr. E. F. Robinson, President of the E. F. Robinson Company, Pittsburgh, Pa., reports extra-long service life—maximum payloads from 15 dump trucks built with bodies and supporting members of J&L Otiscoloy high-strength steel.

Fabricated by the Penn Body Division of the 75-year-old Hockensmith Corporation, and employed by Robinson in the construction of Pittsburgh's new Penn-Lincoln Parkway, the truck bodies have already stood up under 2½ years of punishing service.

In addition, J&L Otiscoloy's great strength permitted Penn Body to employ lighter sections in the truck construction—deadweight was cut and Robinson could haul bigger payloads inside the legal weight limits.

The result—Mr. Robinson will specify J&L Otiscoloy in any new truck body orders placed with Penn Body.

If you're operating or building equipment where deadweight cuts into payloads, and where impact, abrasion or corrosion limit service life, you'll find J&L Otiscoloy can help you, too. Here's why—

Compared to mild steel, Otiscoloy has 4 to 6 times greater resistance to atmospheric corrosion—greater resistance to fatigue and abrasion. Finally, Otiscoloy can be welded by any of the standard methods and can be readily cold formed.

Why not take a tip from other up-to-date operators? Send for a free copy of our booklet—"J&L Otiscoloy—the Transportation Steel." Better still, get in touch with the J&L representative nearest you today.

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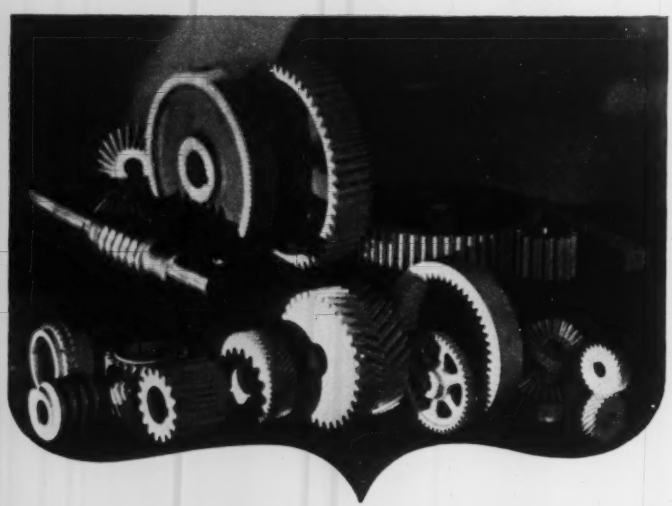

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LETTERS

Concluded from preceding page

interest from other government agencies and from groups of individuals who have dealings with its various departments. This has resulted in our having to set up tours which in turn meant training tour guides and selling the departments on the value of tours.

We feel that copies of your article would be very valuable in this job. I wonder if we can get 30 or 40 tear sheets. If they're not available, may we have permission to reprint the story for distribution to persons in the Laboratory.

R. V. Renken, Lt., U.S.N.
U. S. Naval Ordnance Laboratory
Silver Spring, Md.

• *Due to the popularity of the article "Companies Seek Company: Plant Tours Pay Off," our overrun files have been exhausted. You have permission to reprint the story.—ED.*

It's a Davenport!

I noticed in your article on the Fairless Works (Sept. 22, p. 143) that there were 19 locomotives to be used in operation there, 18 of them 1200 horsepower and the 19th 500 horsepower. I am just curious as to what make the 19th was.

George W. Koch
vice president
Davenport Besler Corp.
Davenport Locomotive Works
Davenport, Iowa

• *The 19th 500 horsepower locomotive was built in Davenport.—ED.*

Picking Up on Packaging

We would appreciate receiving several copies of the article "Wrap Up Savings in Scientific Packaging" (Oct. 6, p. 57).

As contract packagers interested in engineered packaging, we found the article most interesting and would like to use it with proper credit to STEEL, of course.

Leon Zuckrow
Jerome E. Gould Corp.
Brooklyn, N. Y.

• *They're sent.—ED.*

Curious About Cost Controls

Could you tell me where I can get more information and details for setting up manufacturing cost control records, as explained in your article "Manufacturing Cost Control" (Oct. 27, p. 53) written by E. H. Anderson. It was a very interesting story and I would like to know more about it, with a view of setting up such a sytem in our plant.

A. D. Bakke
Western Metalcraft Inc.
Olympia, Washington

• *Contact E. H. Anderson, Harold S. Howard Co., Detroit.—ED.*

Your permission is requested for us to reproduce the article "Manufacturing Cost Control". We plan to reprint about 300 copies to be distributed among our foremen, supervisors and other plant officials.

George A. Raiche
Van Norman Co.
Springfield, Mass.

• *Permission granted.—ED.*

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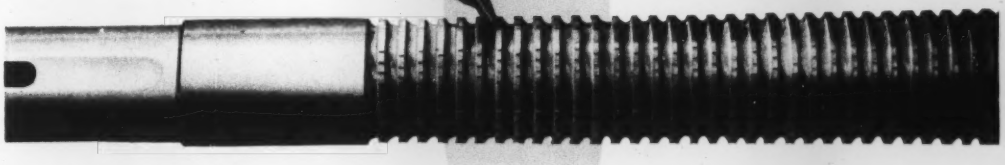
It's easy to SHARPEN all types and sizes of BROACHES with this

VERSATILE **LAPOINTE**

UNIVERSAL BROACH SHARPENER

Built with simplified "Touch-Controls", it practically eliminates all need for skill in sharpening broaches. Any reasonably good tool man can do an expert job in no time at all!

We design and build a complete line of standard and special broaching machines, tools and fixtures.



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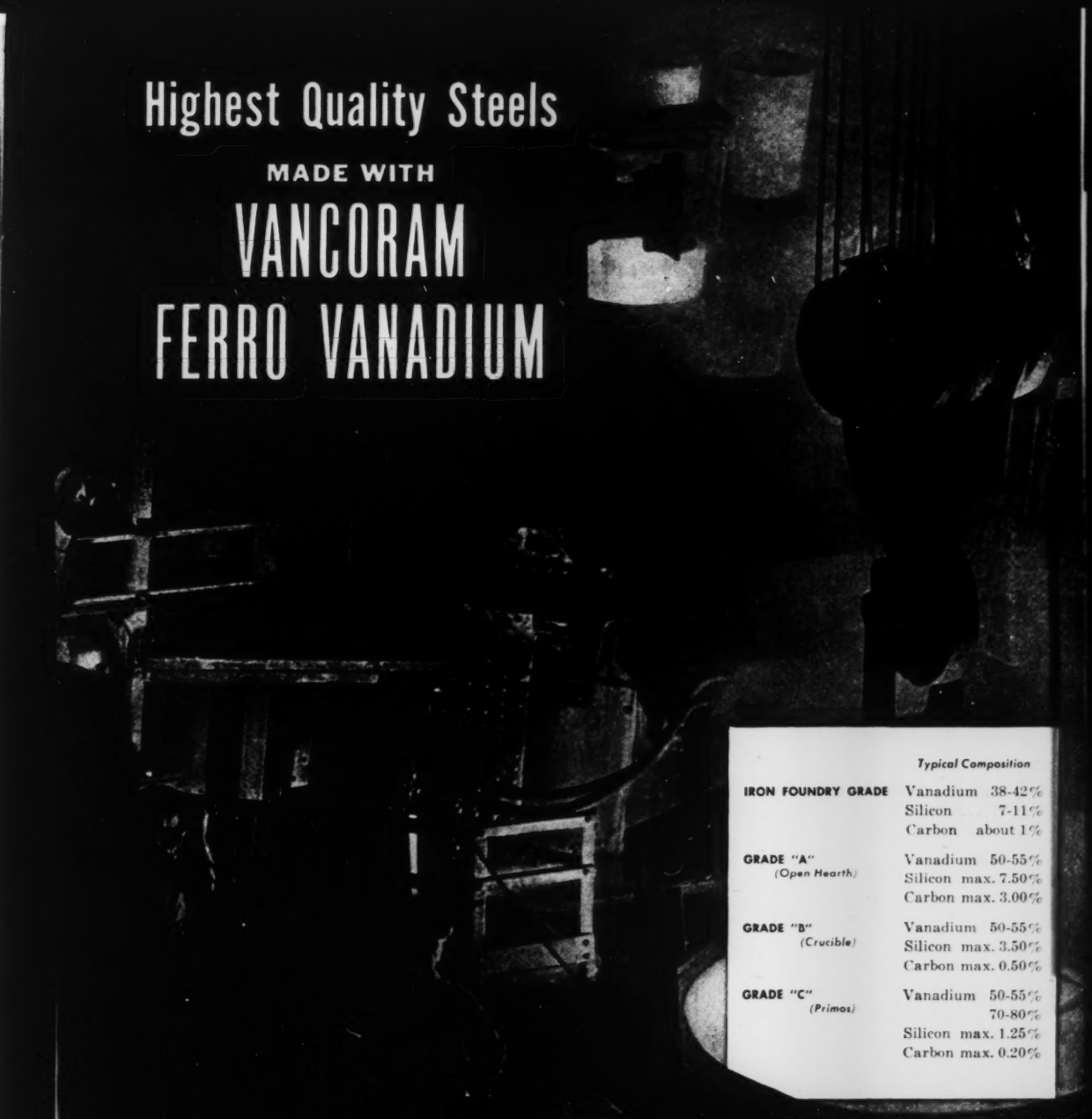

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New facts for your file on U·S·S STAINLESS STEEL

Be sure you are acquainted with the physical properties and fabricating characteristics of grades available to you

● Successful fabrication of Stainless Steels calls for a thorough knowledge of the physical properties and fabricating characteristics of each grade that is available to you. Since these properties and characteristics differ from those of plain carbon steel, modified working procedures are often required.

The complete line of U·S·S Stainless Steels covers a wide range of chemical compositions. However, these grades fall into two general classifications—the chromium-nickel Stainless Steels and the straight-chromium grades.

At the present time, nickel-bearing grades are restricted in their use by government order. For certain essential applications you are permitted to use these nickel-bearing grades, but for the most part you will be working with straight-chromium Stainless Steels.

If your experience has been concentrated on the nickel-bearing grades, it is essential that you know the respects in which straight-chromium Stainless Steels differ. Fabricators who have used these straight-chromium grades as alternates to nickel-bearing Stainless Steels report no difficulty in handling them when proper methods are used.

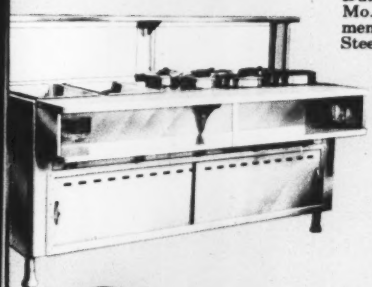
No matter what grades of Stainless Steel you are called on to work with, detailed knowledge of the physical properties and fabricating characteristics is a must for satisfactory performance and economical handling.

Detailed information in this FREE book

You'll find a wealth of information on all grades of U·S·S Stainless Steel in our book "Fabrication of U·S·S Stainless and Heat Resisting Steels." If you'd like a copy, write to United States Steel Company, Room 2806-T, 525 William Penn Place, Pittsburgh 30, Pa.

In addition, our representatives will be glad to assist you in selecting steels and fabricating methods where unusual conditions must be met. Feel free to ask for this help.

Type 430 Stainless successfully replaced nickel-bearing grade in this food serving equipment



Duke Manufacturing Company, St. Louis, Mo.—manufacturer of food serving equipment—has been using Type 430 Stainless Steel as an alternate material for many months now. In every case, the same gage was used in Type 430 that had been used in nickel-bearing grades.

On the basis of this experience, General Manager J. M. Johnson reports:

"We find that Type 430 Stainless Steel is entirely satisfactory in appearance, durability and ease of maintenance for our Thermaduke food warmers and cafeteria counters. In every case, we have followed virtually the same fabricating techniques used with nickel-bearing grades."

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UNITED STATES STEEL

"We know how

says George Sumner,

UNITED STATES STEEL

to handle big ones like this"

UNITED STATES STEEL MACHINIST

● The man in the picture is Machinist George W. Sumner, who has worked in the Forge Department of our Homestead District Works for 43 years. After the steel has been poured, heated, forged, heat-treated and inspected many times—George sets it up on his 15-foot planer and goes to work.

If you asked him to tell you about it in his own words, the conversation might go something like this:

YOU: "*That's a mighty big forging you've got there. What is it?*"

SUMNER: "It's a forged anvil base for a large drop hammer. We started off with a 500,000-pound ingot, but when I'm through with it, it'll ship out at around 300,000 pounds. Right now, it's 14 feet long, 6 feet wide, and 7 feet high."

YOU: "*Must be quite a job handling it on the planer.*"

SUMNER: "Well, it's not exactly child's play. Setting it up correctly is very important. The weight must be spread out properly, because even on this big machine we work down to a few thousandths of an inch."

YOU: "*But once you've made the set-up, the planer runs automatically, doesn't it?*"

SUMNER: "Sort of, but no planer knows how to think. Take lubrication for instance. We have an automatic oil pump, gages and all that. But when you're cutting the short side of a piece, the table only takes a short stroke, and part of the ways don't get oil. If you keep that up, the ways get hot and they warp, and your accuracy is gone. So the operator—that's me—solves the problem by taking long strokes every once in a while, to spread the oil."

YOU: "*In your opinion, what's the secret of making good forgings?*"

SUMNER: "Good steel to start with—and good equipment to work it on. We have both. Then you've got to know what you're doing and take time enough to do it right. You can't leave anything to chance. That's the only way you can be sure your customer will get what he's ordered—a *quality* forging.

• • •

When you buy forgings from United States Steel Company, highly skilled men like George Sumner will work on them. We will match their knowledge and experience against the best in the land. For more information on U·S·S Quality Forgings, write to United States Steel Company, 525 William Penn Place, Room 2806-T, Pittsburgh 30, Pa.

USS

Quality

New facts for your file on U·S·S

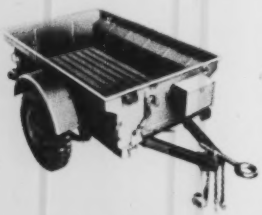
EQUIPMENT DESIGNERS CONTINUALLY FIND NEW USES

Hot water tanks weigh 16% less, require 27% less steel, cost 15% less to ship when built with U·S·S COR-TEN steel.

By using U·S·S Cor-Ten steel in place of carbon steel in their famous "Dura-Stone lined" water heaters and water softeners, the Troup Water Heater Co., Pittsburgh, Pa., has been able to reduce shell thickness in some of these units as much as 31%.

This weight saving in the shell, reduces the total weight of the units about 16%, makes them more readily handled and easier to install. Shipping costs are 15% lower—a sizeable saving when distant markets are being served.

In fabrication, the manufacturer reports, U·S·S Cor-Ten steel offers further worthwhile advantages. Because it is stiffer it forms more smoothly in the bending rolls—fluting difficulties disappear. In welding, Cor-Ten steel behaves better than plain steel, does not tend to burn away under the arc, welding is easier and faster.



In cargo trailers designed for air transport U·S·S COR-TEN steel reduces weight 25%.

This general-purpose Army trailer must be able to carry 500 lbs. of cargo at high speeds over open country and to haul 750 lbs. on highways. That means it has to be very strong and exceptionally rugged. But it also has to be as light as possible so it can be readily air transported. To obtain maximum strength with minimum weight, U·S·S Cor-Ten steel was used both in the main frame side members and in the towing yoke channels. Weight of these members was reduced 25%, yet they are much stronger, tougher, and have more resistance to fatigue, shock and corrosion than if they had been made of heavier carbon steel. This unit was built by Dunbar Kapple, Inc., Geneva, Illinois.

The reason . . . its proved ability

● When U·S·S Cor-Ten—the pioneer low alloy, high-strength steel—was originally developed we had in mind one particular field for its use, namely, to lift the costly drag of deadweight from every kind of *mobile* equipment.

So at first, U·S·S Cor-Ten steel was used to trim thousands of pounds of useless weight off freight and passenger cars. With it, trucks and buses were built lighter. So were mine cars, cranes, shovels, and earth moving machinery of all kinds. Because this equipment weighed less, it did more work, carried bigger loads, cost less to operate. It also lasted longer. Before long, Cor-Ten steel construction had earned a world-wide reputation for reducing weight and reducing costs in equipment that moved or was used to move other materials.

But design engineers, quick to see other possibilities in Cor-Ten steel, rapidly expanded its application to all sorts of *stationary* equipment as well. They figured, and rightly, that when you can *save weight* in any product, you can *save steel*, and *save shipping costs*, too, both on the steel you use and in the manufactured product you ship.

In U·S·S Cor-Ten steel, equipment designers have found a material admirably suited for this purpose. Here is a steel, comparatively low in cost, having good working and welding

Hard working farm equipment built with U·S·S COR-TEN steel does more, lasts longer and is more dependable.

John Deere uses U·S·S Cor-Ten steel in the main axle and in the tractor hitch frame of its famous No. 12-A Combine. Without increasing weight, Cor-Ten steel gives these vital parts maximum strength, maximum toughness and what is of special importance, ensures high fatigue resistance—50% greater than that of plain carbon steel. Racking and twisting strains that could easily cause damage are safely absorbed by Cor-Ten's higher endurance limit . . . and the equipment stays on the job.

This application is typical of Cor-Ten steel's increasing use in farm equipment such as feed trucks, grain trailers, fertilizer spreaders, farm wagons and stake bodies. As one manufacturer puts it, "Because farm equipment takes terrific abuse in the field and is generally exposed to the weather without any protection whatsoever, we have found high-strength steel construction a 'must'."

U·S·S HIGH STRENGTH STEELS

U·S·S COR-TEN · U·S·S MAN-TEN · U·S·S TRI-TEN

HIGH STRENGTH STEELS

USS TRADE MARK HIGH STRENGTH STEEL UNITED STATES STEEL

FOR U·S·S COR-TEN HIGH STRENGTH STEEL

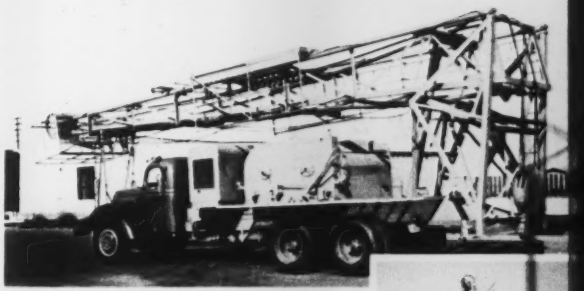
to reduce weight, increase durability and cut costs.

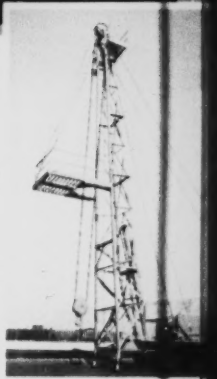
properties, with which they can safely and economically reduce weight—but which has the further important advantage of *great durability*. For COR-TEN steel not only has a yield point one and a half times that of carbon steel but it has 50% higher fatigue strength, offers superior resistance to abrasion and impact; and in addition has unusually high resistance to atmospheric corrosion—4 to 6 times that of plain steel.

As a result, U·S·S COR-TEN steel is now being extensively used, not only in mobile equipment, but to reduce the weight, or to increase the life, of water heating tanks, shipping containers, storage racks and bins, pallets, refrigerator sheets, metal awnings, smoke stacks, shower partitions, floor plates, transformer housings, pole line hardware etc. New applications are constantly being turned up.

In these products, every pound of weight saved has meant fewer pounds of metal to buy—fewer pounds to move—and fewer pounds to ship. That makes for SAVINGS all along the line.

If you want to reduce the weight of your equipment without reducing its durability—or to increase its durability without increasing its weight—get more information by sending for our booklet on U·S·S COR-TEN steel.

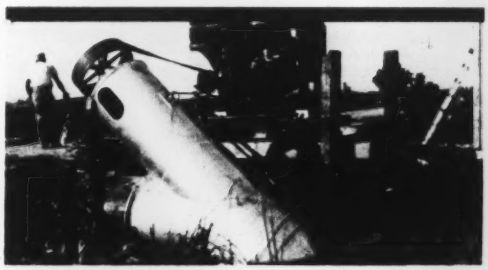




Portable derrick built 5 ft. higher than before, weighs 800 lbs. less—brake drum lasts 5 times longer—when COR-TEN steel replaces carbon steel.

By taking advantage of U·S·S COR-TEN steel's greater strength and durability, Hopper Machine Works, Inc., Bakersfield, Calif., were able to increase the height of this portable drilling rig from 47 feet to 52 feet and at the same time reduce derrick weight 800 lbs.

Impressed by COR-TEN steel's performance in the derrick structure, the manufacturer decided to utilize its superior properties elsewhere. By using 1" COR-TEN steel plates in place of both mild steel and cast steel for brake drums, drum life was increased approximately 5 times.



Irrigation and drainage pumps, built of U·S·S COR-TEN steel, operate without repairs, last 4 times as long.

Built by the Couch Manufacturing Co., numerous turbine pumps like this, with a capacity up to 80,000 gallons per minute, have been in operation since 1938 in the South Florida water control development.

Installed in silty water containing tannic and sulphuric acid in varying amounts, pumps are alternately submerged in the water and exposed to the atmosphere. Under these severe conditions, it has been necessary to make repairs to pumps built of plain carbon steel* which had corroded after 5 or 6 years.

In contrast, all pumps built of U·S·S COR-TEN steel are still in service—during 14 years' operation have never been pulled out for repairs of any kind. "And," says W. W. Kerr, President of Couch Manufacturing, "they are in apparent good condition and should easily last another 10 years. I place their life expectancy as at least 4 times that of carbon steel."

**Built during the war when COR-TEN steel could not be obtained.*

GET COMPLETE INFORMATION.

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525 William Penn Place, Room 2806-T
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UNITED STATES STEEL

New facts for your file on

U·S·S CARILLOY STEELS

U·S·S CARILLOY steel springs soak up 8 million lb.-ft. torque!

Alloy springs cushion tremendous mechanical shocks in 200-ton short-circuit generators . . . save expense of forgings

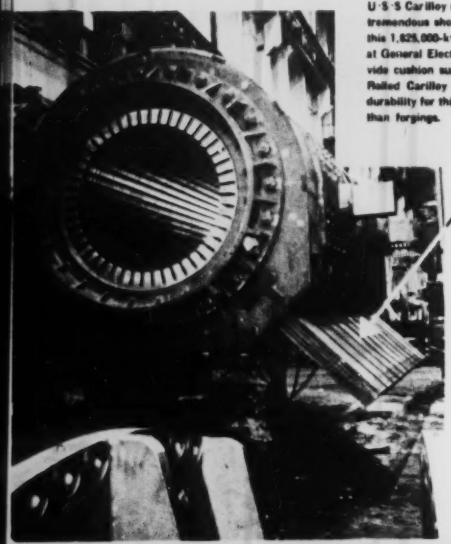
● In testing high-voltage circuit breakers, engineers at General Electric Company *intentionally* short-circuit two huge motor-driven generators. Each of these test generators is normally rated at 125,000 kva, but provides short-circuit currents as high as 182,000 amp, instantaneous peak of the offset wave, corresponding to about 1,625,000-kva rms symmetrical short-circuit duty. Such operation causes tremendous mechanical stresses to build up inside each machine. These stresses create a torque that tries to twist loose the 200-ton stator assembly.

But no damage is done! These powerful machines are mounted on U·S·S CARILLOY steel plate springs that cushion the shock and then damp out any vibrations that follow. The springs must absorb these terrific shock torsion loads as often as 40 times an hour; so a tough, very durable steel is needed.

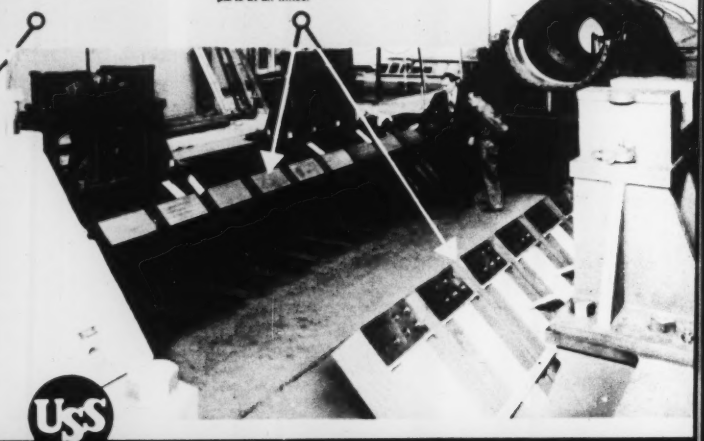
Forged springs were considered first. But GE engineers, with the cooperation of United States Steel metallurgists, found that a rolled alloy steel, U·S·S CARILLOY 4340, provides the required mechanical properties at *much lower cost*. This steel is tough, even though extremely hard, and it assures good endurance at 40,000 psi, as required in this application. In addition, it is easy to heat-treat.

This CARILLOY steel is giving excellent service. Under the most severe short circuit, developing a whopping 8 *million lb.-ft.* of torque, frame rotation is about $\frac{1}{2}$" each way at the point of attachment of the springs. And the axial centerline of the machine stays within 30 mils of its normal position. These movements are sufficient to cushion the shock effectively.

Any time you need a steel that will provide high strength and toughness, superior resistance to shock and torsion with minimum weight, or any combination of these properties, look for a CARILLOY steel. Experienced U·S·S metallurgists will gladly help you choose the one best suited to your requirements.



U·S·S Carilloy steel plate springs cushion the tremendous shock torsion loads developed in this 1,625,000-kva short-circuit test generator at General Electric Company. They also provide cushion support for the stator assembly. Rolled Carilloy 4340 has the toughness and durability for this application, and it costs less than forgings.



The 200-ton stator assemblies of General Electric's short-circuit test generators are mounted on Carilloy plate springs like these. The springs are mounted at a 45° angle to provide both rigid vertical support and cushioning of shock torsion loads. They keep the stator properly aligned with other machine parts at all times.

USS

UNITED STATES STEEL COMPANY, PITTSBURGH · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. · UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST
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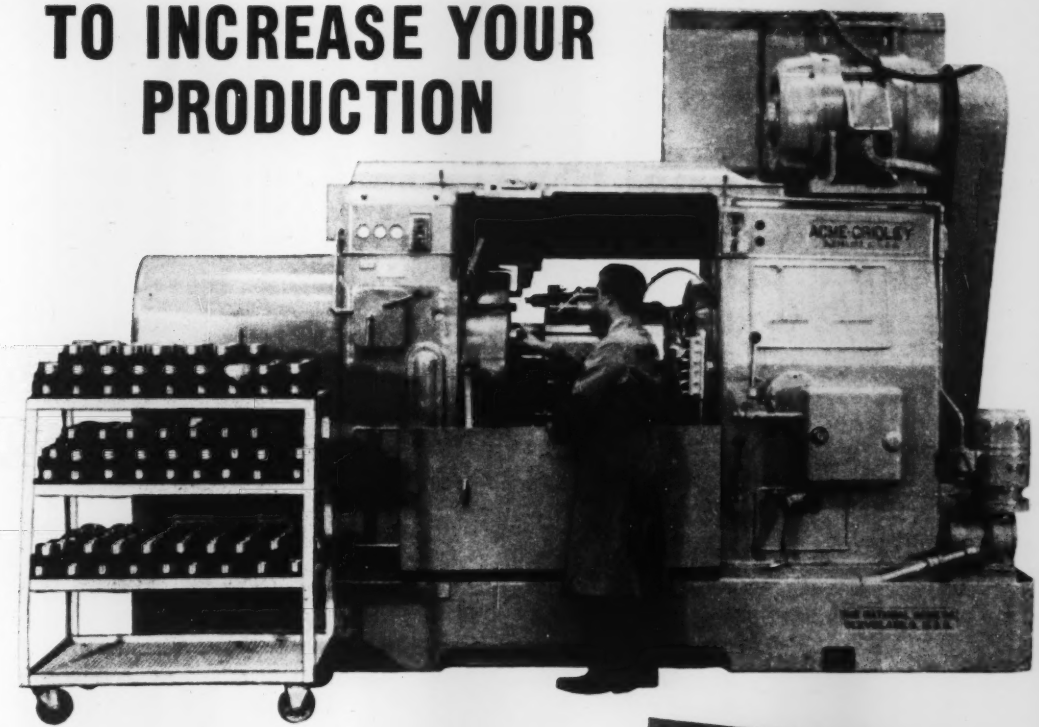
UNITED STATES STEEL

TO INCREASE YOUR PRODUCTION



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12 months "Snorkel" duty... and still in excellent condition

↑ Relubrication fittings for Fafnir Pillow Blocks are indicated by arrows. Once-a-week lubrication plus Fafnir Mechani-Seals protect submerged bearings.

↓ Complete installation shows relubrication fitting, pipe and Fafnir Pillow Block.

Standard Fafnir Ball Bearing Pillow Blocks

On a conveyor used for lifting steel balls from the water quench bath of a rotary type furnace are two 1½" Fafnir LAK Type Ball Bearing Pillow Blocks. These bearing units, running at 2-3 r.p.m., are three feet under water. The water bath has a pH of about 6 and a temperature automatically controlled at 90° F.

After 12 months of operation at 16 hours a day, 6 days a week, the pillow blocks were removed for inspection. Their condition is shown in the unretouched photograph below. According to a maintenance report, both the pillow blocks and bearings were in excellent condition and suitable for further service.

This application may help you to find a better, cheaper way to use bearings. Although it's unusual . . . it serves to demonstrate the multiple-uses of Standard Fafnir Ball Bearing Units plus their ability to operate efficiently under extreme conditions. Whatever your bearing problem, a few minutes spent with a Fafnir representative may help you solve it as successfully. The Fafnir Bearing Company, New Britain, Conn.

FAFNIR

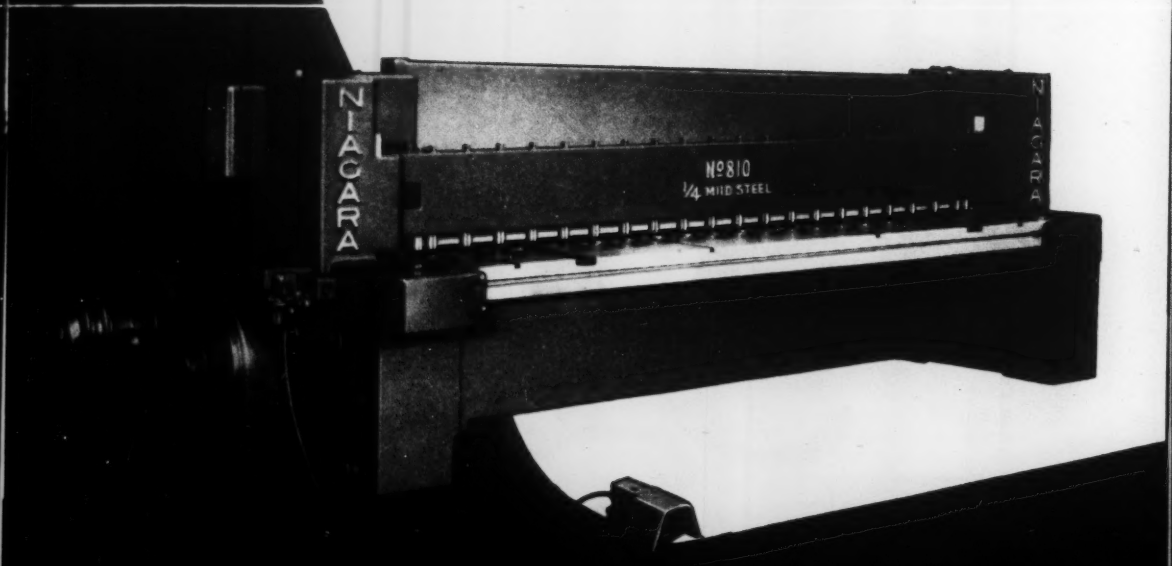
BALL BEARINGS

MOST COMPLETE LINE IN AMERICA

Unretouched photograph of Fafnir Pillow Blocks, one disassembled, shows condition after 12 months operation 3 feet under water.

NIAGARA SHEARS

at General Sheet Steel Co., Detroit, Mich.



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thousands of tons
of steel
of all kinds

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Write for Bulletin 69

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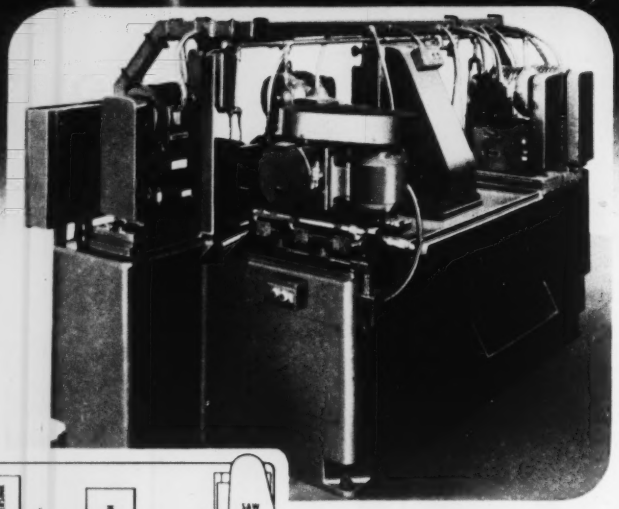
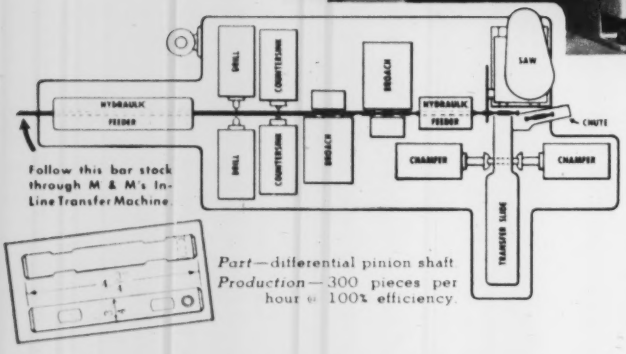
MP/SF

Progressive Square Foot



Typical M & M progressive IN-LINE automatic transfer machine.



Part—differential pinion shaft
Production—300 pieces per hour @ 100% efficiency

Motch & Merryweather's forward-looking design *unitizes* a number of operations in the same machine. You obtain maximum usable production per square foot of floor space. Furthermore, you effect the greatest possible savings in time, overhead and operating costs.

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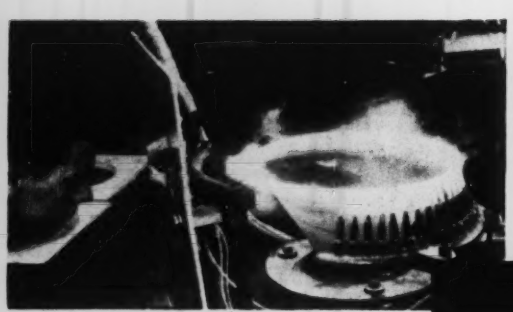
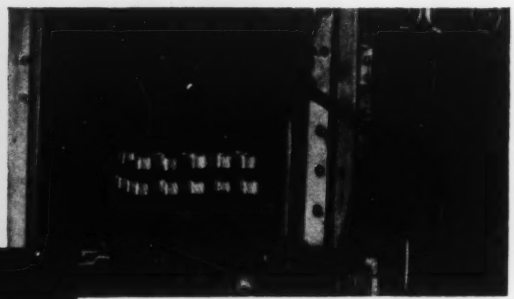




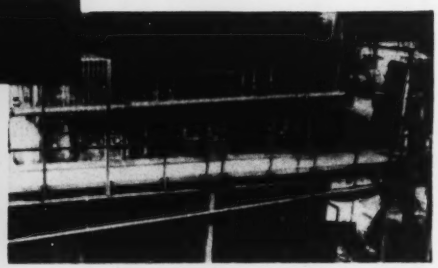
ELECTRONICS—Glass face of television tube is bonded to metal cone with automatic GAS equipment, assuring strong, vacuum-tight glass-to-metal bond, for large manufacturer of electronic equipment.

GRAPHIC ARTS—Monotype casters with Gas-fired metal pots, Linotype machines, smelters, ink dryers, stereo casters, etc. utilize the economical, versatile flames of Gas for printing in modern plants.

GAS... THE MODERN FUEL FOR ALL INDUSTRY

METALS—Gas meets rigid heat-processing requirements of production-line heat treatment, as in the case hardening of gears, for an automobile manufacturer, because Gas affords precise, automatic temperature control.

GLASS—Modern Industrial Gas Equipment is found throughout the glass industry—an example of which is this 100-ton continuous batch Gas-fired melting tank for making glass for a large industrial manufacturer.



Whatever your industrial production problems, however tight your schedules, Gas and Modern Industrial Gas Equipment can provide the answers. For the facts on GAS, call your Gas Company Representative, today.

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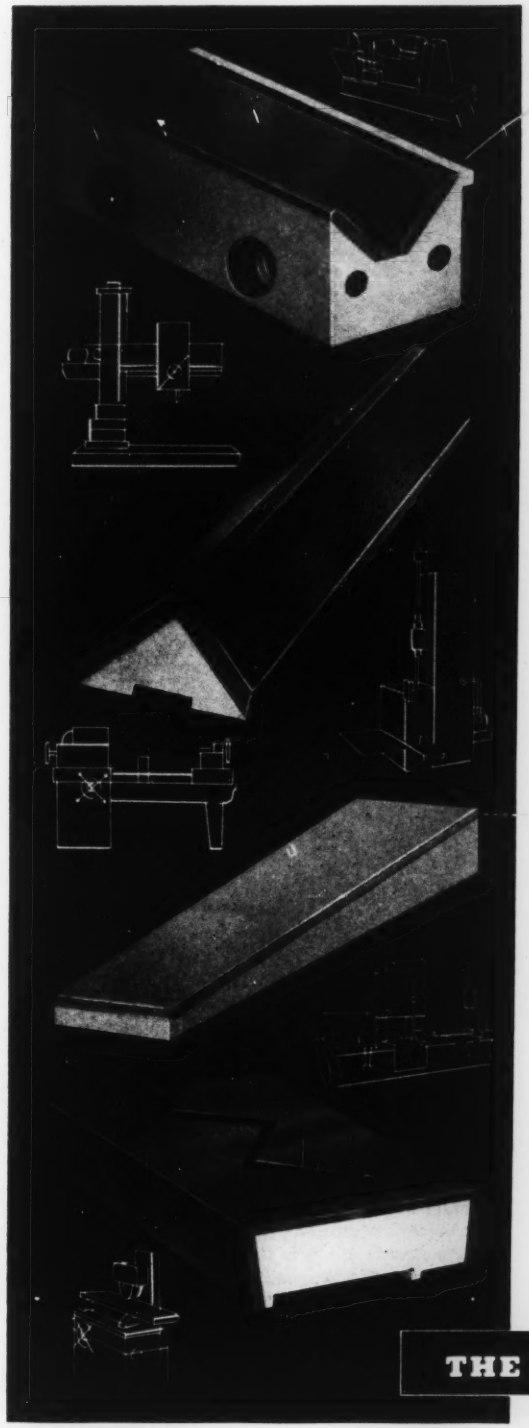

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let'em go with OK hardened ways, gibs, ball races, and Ampco bronze wear strips

The ultimate success and accurate life of your machine depends to a large extent on the accuracy, and uniform high hardness of its ways, gibs, ball races or wear strips. OK parts are the finest. They are made of special tool steel welded to a backing of soft tough steel under 2500 tons pressure, then hardened to a Rockwell C-65-66 and ground to tolerances of ± .00015 (both straight and parallel). They are available in all sizes and shapes, to meet your particular requirements.

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sps JENKINTOWN, PENNSYLVANIA

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8 ***Insurance Advantage*** . . . of diesel over gasoline engine, for example, will soon pay for installation.

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13 ***More Compact Power*** . . . Fairbanks-Morse engines give you more power per foot of floor space, more power on present foundation.

14 ***Minimum Attendance*** . . . Fairbanks-Morse in-plant generating sets require far less supervision or maintenance.

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If you are seeking the keys to your power problem, write us today, outlining your needs. Fairbanks-Morse engineering can give you a *proved* answer . . . based on over 50 years' experience in industrial and municipal power generation. Fairbanks, Morse & Co., Chicago 5, Ill.

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. . . . . SAVING $18,000 A YEAR . . .

That's right! Saco-Lowell did it with Westinghouse Induction Heating.

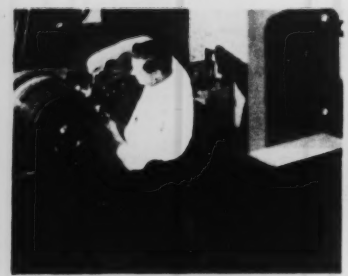
Before installing Westinghouse, the Company had a great deal of trouble hardening critical front rolls for their well-known line of textile machinery. The process they used was costly. It demanded utmost skill, took up space, and required much rehandling of parts. Also, a great deal of straightening was needed after hardening, and rejects were high.

Now, with two standard Westinghouse vertical scanners and a 50 KW RF generator, Saco-Lowell has found the solution to their production problem. Semi-skilled labor, using in-line production techniques, has boosted output 145% . . . reduced floor area requirements to a minimum . . . eliminated eight material handling loads . . . and cut rejects entirely.

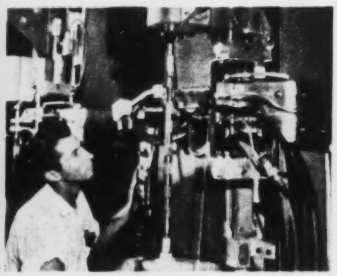
Better, faster, easier—all with Westinghouse induction heating. But the real answer comes at the end of each year . . . $18,000 cash in the bank—profit-producing savings . . . savings that can be yours if you have a hardening, joining, or annealing problem.

So why not take advantage of this money-saving suggestion: investigate Westinghouse Induction Heating Equipment today. Call your nearby Westinghouse distributor, or write to Westinghouse Electric Corporation, Induction Heating Section, 2519 Wilkens Ave., Baltimore 3, Md.

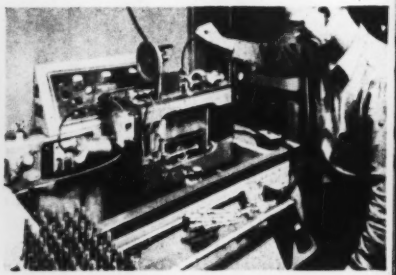
OTHER MANUFACTURERS ALSO PROVE WESTINGHOUSE INDUCTION HEATING EFFICIENT . . . PROFITABLE



Seaboard R. R. uses Westinghouse Induction Heating to solder traction motor coil leads into commutator riser slots. Quick, reliable, efficient, it is also practical and economical for both soldering and unsoldering leads on repair jobs.

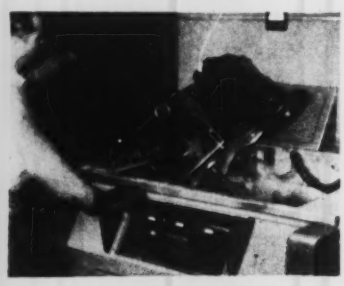


Westinghouse Vertical Scanner . . . self-contained, completely automatic, permits complete or selective case hardening of shafts, rolls, and other cylindrical parts up to 2" in diameter and 36" long.



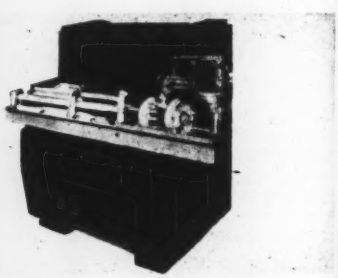
Bell and Gossett had a problem. To carburize a shaft thrust collar required the use of a brass sleeve and 100% inspection. With Westinghouse Induction Heating, quality control replaced inspection, and the brass sleeve was eliminated.

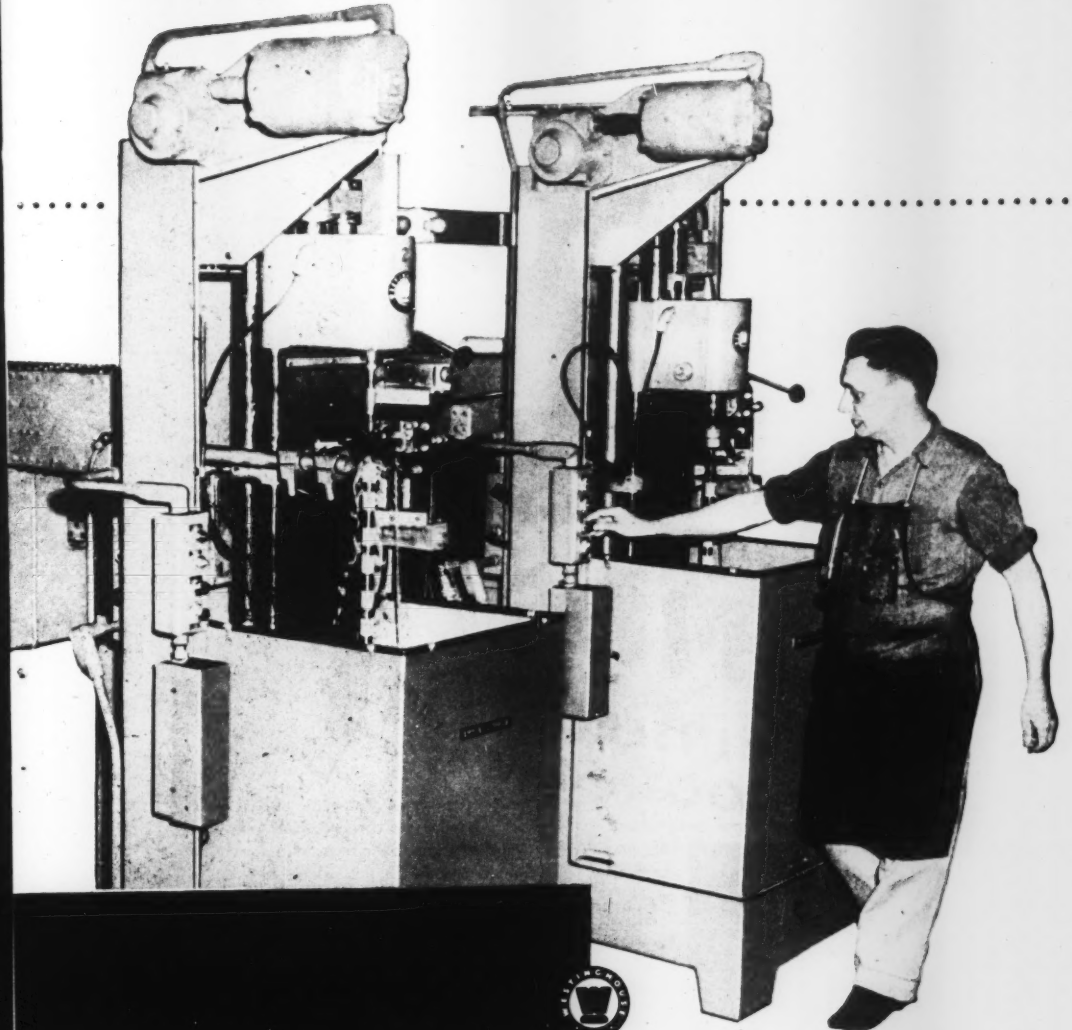
Maytag's two 20 KW RF generators paid for themselves in three months. 400 shafts are hardened an hour, cutting former time by 60%. Straightening and scale have been eliminated entirely, resulting in savings and speed.



Westinghouse Inductatl gear-hardening machine . . . simple, rugged, contour-hardens gears by induction heating—automatically. Spur gears, cluster gears, etc., from 2½" O.D. to 8½" O.D., can be handled economically.

Westinghouse Horisontal Scanner . . . feeds, heats, and quenches, then discharges—all completely automatically. Built to handle parts from ¾" to 2" in diameter, and 2½" to 20" long at minimum costs, top efficiency.





INDUCTION HEATING

Two booklets help you solve induction heating problems. *For information on Westinghouse Induction Heating, send for either or both of these booklets:*

B-4782 for details on heating, joining, and annealing, with numerous case histories.

B-5259 for details on the Westinghouse Inductall gear-hardening machine.

Westinghouse Electric Corporation,
Induction Heating Section,
2519 Wilkens Avenue,
Baltimore 3, Maryland

Please send booklets B-4782 and B-5259 to:

Name.....

Company.....

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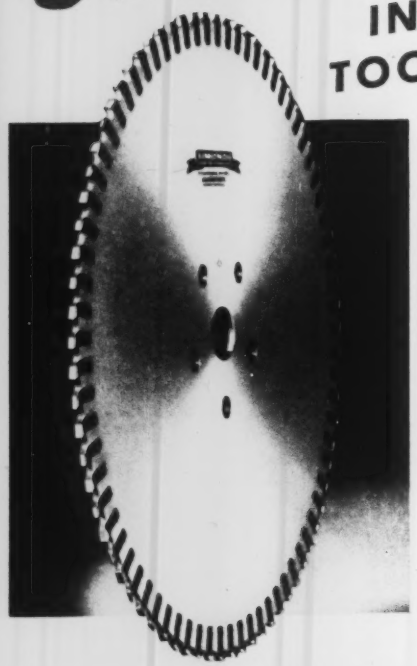
City.....**Zone**.....**State**.....

A Wedge for every tooth means Added Strength for SIMONDS

INSERTED-TOOTH SAWS



Here's the most rugged design of all metal-cutting saws . . . the tough saw-plate of special Simonds Steel, fitted with alternating square and beveled inserted teeth . . . *and with a wedge for every tooth*, to give that extra strength for heavy cutting. In fact, this saw is practically indestructible, for it can be readily repaired if damaged and restored to original efficiency by an average mechanic.

Yet Simonds Inserted-Tooth Saws have the same quick clearance as other Simonds Saws . . . and the inserted teeth cut a "Tri-vided" chip that falls free in 3 pieces.

For general heavy-duty work, this is *Industry's No. 1 Saw.* And for other types of work, Simonds also makes Circular Metal Saws in Segmental, Solid-Tooth and Carbide-Tipped types. So ask your Industrial Supply Distributor to secure for you the *unbiased* consulting of a Simonds Saw Engineer.

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Simonds Abrasive Co., Phila., Pa. and Arvida, Que., Canada

IN VAPOR DEGREASING

WHEN SO MUCH

DEPENDS ON A QUALITY SOLVENT

IT PAYS TO SPECIFY

SPEEDY, DEPENDABLE...

"TRICLENE" D Trichlorethylene is the result of over 20 years of research and practical experience in the degreasing field. Made under carefully controlled conditions by the pioneer manufacturer of degreasing solvents in the U. S., each shipment of "Triclene" D is carefully pretested for stability and purity... must meet test standards higher than those established by military and federal specifications (MIL-7003 and O-T-634). Yet "Triclene" D costs no more than other leading brands of degreasing solvents.

"Triclene" D is available nationally in 55 gallon drums and tank cars of various sizes. Distribution points in over 100 principal cities are ready to serve you with prompt deliveries. And trained Du Pont technical representatives with broad experience in the field will be happy to work closely with you in keeping your degreasing installations operating at peak efficiency.

E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Dept., Wilmington 98, Delaware.

Send for your copy of "Vapor Degreasing with Du Pont Non-Flammable Solvents." It shows you how and where "Triclene" D can be used to save time and cut costs in metal cleaning.

E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Dept., Wilmington 98, Delaware

Please send me detailed information on Vapor Degreasing: applications, advantages, equipment used . . . and more facts on Du Pont "Triclene" D. We are interested in cleaning____products.

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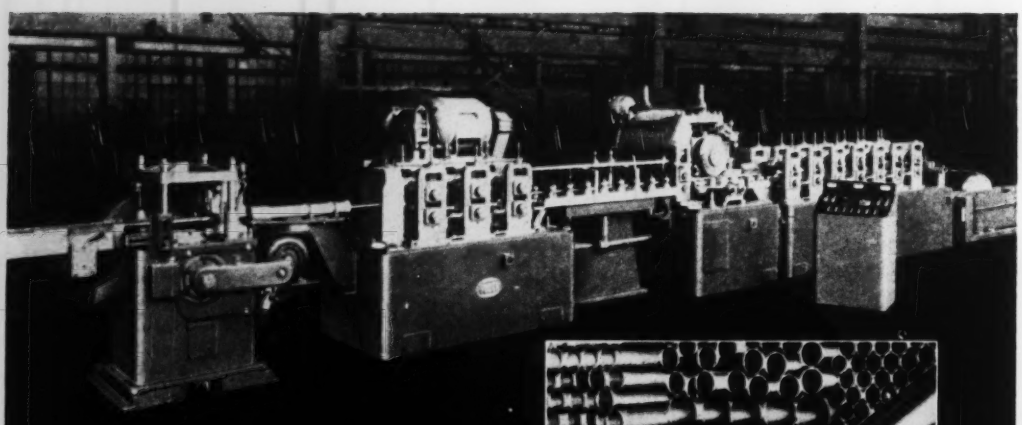
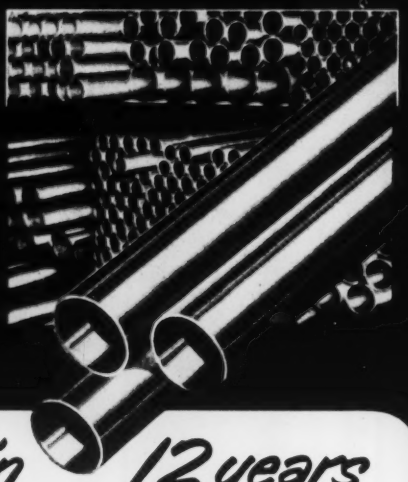
DU PONT 150th Anniversary

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*



Electric Weld Pipe and Tube Mills



1300% Increase in 12 years

In the brief period of twelve years, from 1938 to 1950, the manufacture of electric welded pipe and tubing in the U. S. A. grew nearly 1300%, becoming one of the child prodigies of the American metal working industries.

The beginning of this development was sparked by the introduction of the revolutionary new Yoder electric resistance welder, and followed by many other Yoder improvements in cold process pipe and tube making equipment. The latest of these is the highly efficient Yoder 4-in-1 cross type transformer.

Year by year, Yoder has built, installed and serviced more electric-weld tube mills than all other builders combined. The experience so gained has been invaluable in bringing Yoder mills to their present state of pre-eminence.

Most significant is the fact that the demand for electric welded pipe and tubes has expanded faster than the supply.

If you have been thinking of making any grade or grades of pipe and tubing, from steel or non-ferrous metals, in sizes from $\frac{1}{4}$" up to 30 or 40-inch diameter, Yoder literature, information and recommendations are yours for the asking.

THE YODER COMPANY • 5502 Walworth Avenue, Cleveland 2, Ohio

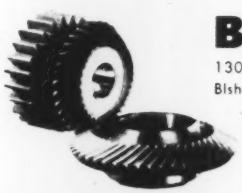
Complete Production Lines

- ★ **COLD-ROLL-FORMING and auxiliary machinery**
- ★ **GANG SLITTING LINES for Coils and Sheets**
- ★ **PIPE and TUBE MILLS–cold forming and welding**

ENGINEERING YODER MANUFACTURING

Quantity Production . . .

- Quantity production of identical gears offers a challenge that we here at BRAD FOOTE are eager to accept.
- Multiple spindle machines, duplicate machines, numerous and varied machines, every machine that's needed—PLUS men of long experience making close tolerance gears . . . these factors make it possible for us to confidently accept such a challenge.
- When you specify BRAD FOOTE gears, you do so with the knowledge that each gear will be made to exact specifications; that every gear of a quantity will be identical in structure, in size, and in appearance; that each operation on every gear will be performed by BRAD FOOTE people in BRAD FOOTE shops. No one will share our responsibility.
- You will be satisfied with the BRAD FOOTE gears you buy because they will give long, economical service on the equipment you operate, or on the machines you sell to others.
- Your inquiries are invited.



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AMERICAN GEAR & MFG. CO. • Phone: Lemont 920 • Lemont, Illinois

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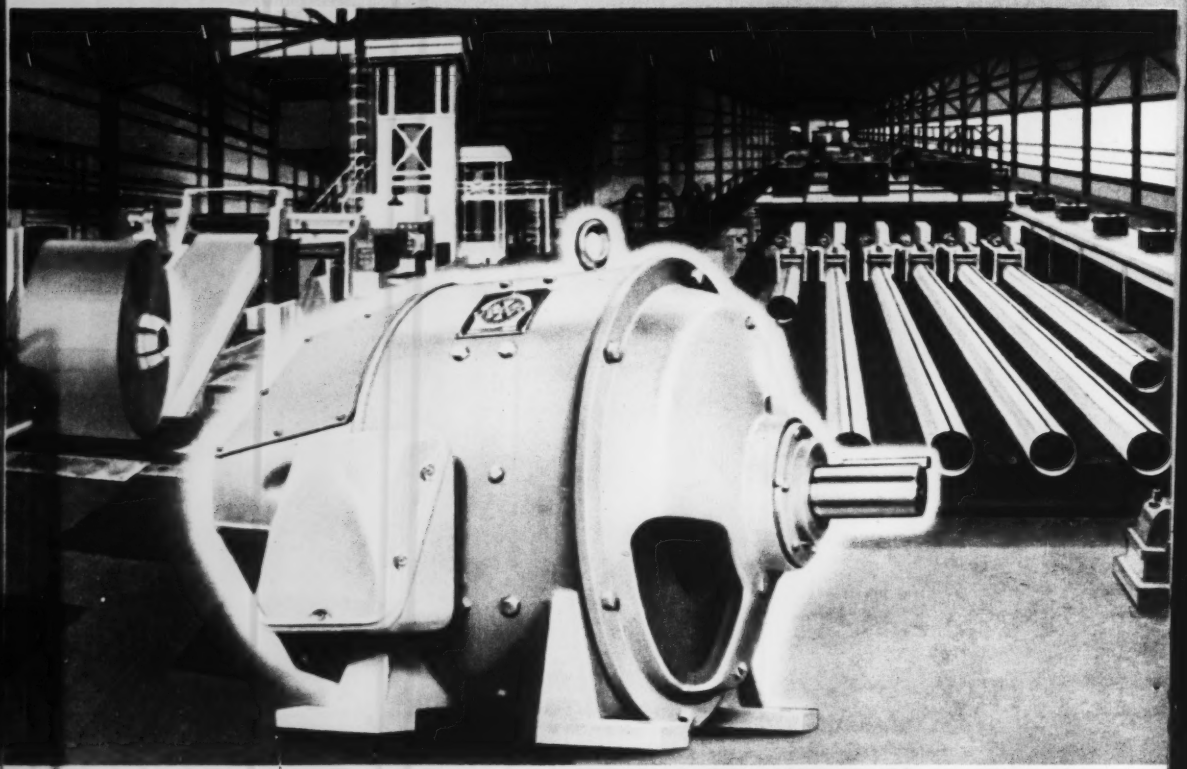
For tough power jobs....



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TYPE 'T' HEAVY DUTY

D-C. MOTORS

3/4 TO 1000 HORSEPOWER

"The Toughest Motors Ever Built"

and precise speed control

This sturdy, versatile DRIVE MOTOR *meets all your requirements for*

- ✔ UNLIMITED SPEED CHANGES
- ✔ CONTROLLED ACCELERATION AND DECELERATION
- ✔ JOGGING, INCHING, CREEPING
- ✔ SMOOTH STARTING, QUICK STOPPING

Early Reliance developments in drive motors gave industry wider ranges of speed adjustments than any motors previously available. And Reliance has specialized ever since in drive motors combining heavy duty construction for the toughest power jobs with precise speed control to meet your most exacting requirements. Use Reliance Type 'T' Heavy Duty Drive Motors on the most grueling applications and your experience will reveal why long-time users have called them *"The Toughest Motors Ever Built"*. Get dependable motor response to all-electric control in a Reliance-engineered drive and you have the means of achieving and maintaining maximum production from any machine.

WRITE for D-c. Motor Bulletin C-2001 and Bulletin D-2311 which highlights the role of Reliance adjustable-speed drive motors in single and multi-motor drive systems.

HOW RELIANCE ENGINEERING adapts the motor to your specific power needs...

Reliance adjustable-speed drive motors are engineered to respond instantly and accurately to the signals of associated controls and regulators in any motor-drive system. Co-ordinating mechanical design, horsepower and speed range of the motor with other components in a drive is the specialized job of Reliance Application Engineers. Their application experience and practical production knowledge give you whatever operating flexibility is required to produce more goods at less cost.

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RELIANCE ELECTRIC AND ENGINEERING CO.

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you can't beat the S-B zinc process for conversion coatings...

Yes, this H-VW-M S-B Process for Zinc Plating provides a pure electrolytic zinc deposit especially adapted for subsequent conversion coatings (passivating or brightening). Why? . . . because it's a high speed alkaline process that gives a fine grained deposit; there is no organic inclusion—it's an all metal deposit that converts rapidly and evenly when subjected to a passivating bath; it's semi-bright directly from the plating bath—when bright-dipped it results in a beautiful satiny sheen. S-B Process zinc plated steel is adaptable to drawing, bending, forming and solders easily when compared to other zinc process coatings.

This exclusive process is just one of the results of over eighty years of constant electroplating development—a continuing policy summed up in H-VW-M Platemanship . . . your working guarantee of the best that industry has to offer—not only in a zinc process for conversion coatings—*but in every phase of plating and polishing.*

8408

PLATEMANSHIP

Ask for the bulletin containing full details of the H-VW-M S-B Process for Zinc Plating.

Your H-VW-M combination of the most modern testing and development laboratory . . . of over 80 years experience in every phase of plating and polishing . . . of a complete equipment, process and supply line for every need.

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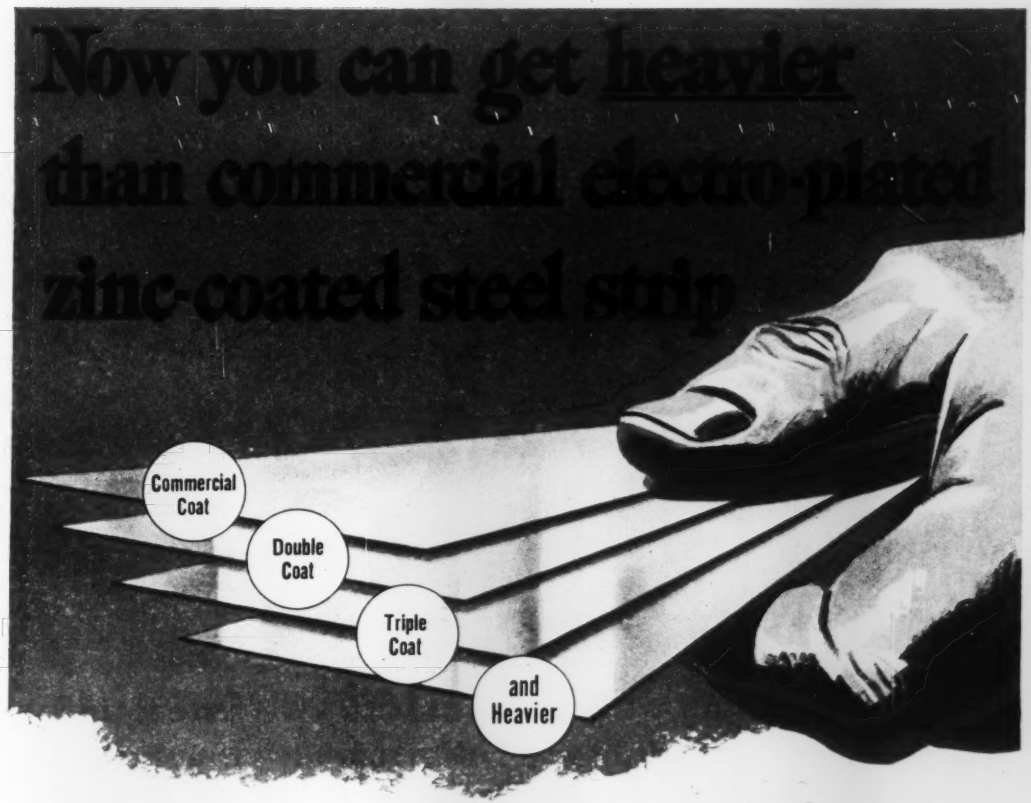
INDUSTRY'S WORKSHOP FOR THE FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES

Now you can get heavier than commercial electro-plated zinc-coated steel strip



When your production standards demand extra protection from corrosion you can get it now with the *double*, *triple*, and even *heavier* electrolytic zinc coated Thomas Strip. This cold-rolled strip steel has a dense, uniformly distributed peel-proof zinc coating that adds substantially to product life and appearance. Coated edges can be furnished in most sizes.

In addition to the extra heavy zinc coatings, Thomas has facilities to handle the heavier gauges of strip in coils or cut lengths—thickness limits up to .125″ (full range .005″ to .125″)—widths $\frac{1}{4}$″ to approximately 22″.

Thomas electro-plated zinc strip may be formed, bent, and drawn without affecting the bond or causing flaking. Now it is available in *commercial*, *double*, *triple*, and *heavier coatings*. It can be furnished bonderized in strip thicknesses of approximately .050 and lighter to provide extra adherence for paint, lacquer, and enamel. To learn how to put extra quality into your products with precoated Thomas Strip write today.

Cold-rolled strip steel electrolytically precoated with Zinc, Copper, Brass, Nickel, Lead-Alloy, and Chromium in Natural, Planished and Buffed Finishes—Hot Dip Tin and Lead Alloy Coated—Lacquer Coated in Colors—Annealed Spring Steel—Alloy Strip Steel—Uncoated Strip Steel. Carefully produced to your specifications.

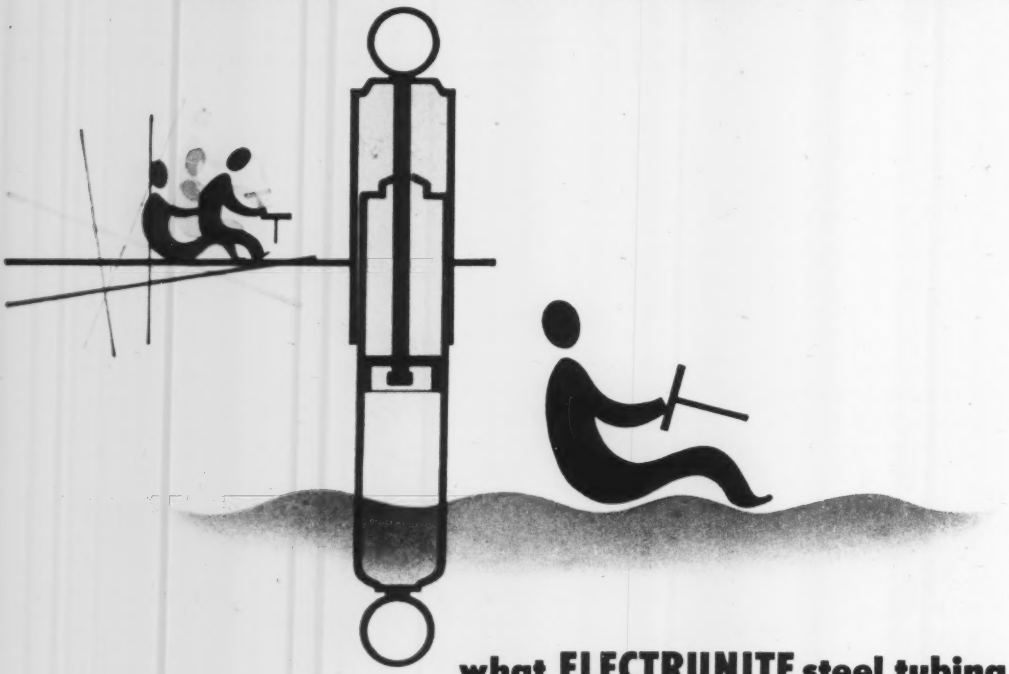
Thomas Strip

a product of

Pittsburgh Steel Company

Thomas Strip Division • Warren, Ohio

another case where welded steel tubing does the job best . . .



what ELECTRUNITE steel tubing did for shock absorber manufacturers

it can do for you . . .

Today's airplane-type automobile shock absorbers are high-precision devices. They give years of service with practically no maintenance or attention. What's more, they cost . . . and weigh . . . much less than the old-style shock-absorbers that required new webbing or new springs or replacement all too often.

Today's hydraulic shock absorbers use large quantities of ELECTRUNITE Steel Tubing . . . the welded steel tubing that provides plenty of surplus strength to stand rough service under severe loads for many types of devices.

The extremely close ID and OD tolerances of ELECTRUNITE Steel Tubing enable manufacturers to use it without expensive preliminary reaming or finishing. Surfaces are clean, concentric, free from defects. It's produced in carbon, alloy, and stainless grades, in a wide range of sizes, wall thicknesses, and lengths.

If you'd like more information about how ELECTRUNITE Steel Tubing is helping a wide variety of manufacturers and products, write to:

REPUBLIC STEEL CORPORATION
STEEL AND TUBES DIVISION
224 EAST 131st STREET • CLEVELAND 8, OHIO

1902 50th ANNIVERSARY 1952
STEEL and TUBES DIVISION
ELECTRUNITE TUBING

REPUBLIC STEEL

ELECTRUNITE TUBING

Take the problem out of welding problem steels!

Use P&H Low-Hydrogen Electrodes

The right low-hydrogen electrode for your job!

70LA-2 (E6016, E7016)
General-purpose electrode for high-carbon, low-alloy, high-tensile, and high-sulfur free-machining steels.

70LB (E7016)
For repair welding of Grade B and other castings of similar analysis.

P&H .25C (E7016)
For castings repair where high carbon is preferred to alloys for raising tensile strength.

75LP (E8016)
For 2% to 3% nickel steels, both cast and rolled.

80LP (E8016)
For chrome-moly power piping and fittings.

90LE (E9016)
For higher-analysis chrome-moly power piping and fittings.

P&H .40C (E9015)
For .40 carbon castings and rolled steels where you want to match both chemical and mechanical properties.

AW2B (E9016)
For repair welding of cast armor, "off-analysis" steels, rerolled rail steels, and high-sulfur steels.

P&H # 7 (E9016)
For repair welding of Grade C and other castings of similar analysis.

90LH-2 (E10016)
For alloy steels, such as SAE 8630, 4130, and comparable types where the weld metal must match the heat-treating properties of the parent metal.

P&H # 12 (E10016)
For difficult fabricating jobs involving high-tensile and alloy steels with little or no preheat.

P&H # 17 (E12016)
For high-hardenable steels subject to high impacts through a wide temperature range.

P&H # 21 (E15016)
For aircraft and similar steels, such as 4340 and 4130.

. . . . and get high-strength welds that are free of underbead cracking

P&H has the most complete line of low-hydrogen electrodes in the industry — many "custom-made" to match the chemical analysis or heat-treating properties of a variety of alloy steels. This wide selection eliminates the difficulties in welding problem steels, such as high-sulfur free-machining, high-carbon, low-alloy, and high-strength steels.

The core wire of these electrodes is of a mild steel or a low alloy, thereby greatly reducing the cost of the low-hydrogen electrode, as compared to the higher-alloy types.

The coating ingredients of these P&H electrodes are mineral- and also hydrogen-free, with low moisture content. This eliminates underbead cracking and permits the welding of "difficult" steel with little or no preheating.

Other important advantages are: Better impact properties through a wider temperature range; Greater ductility at high tensile strengths; High-quality X-ray; As-welded properties that approach values ordinarily obtained only after stress relieving; More accurate control of alloying elements; No need for annealing before enameling; Higher heats for higher deposition rates.

Get better welds on "difficult" steels — cut your costs. Get P&H Low-Hydrogen Electrodes from your P&H representative or local distributor.

Just off the press — new bulletin on P&H Low-Hydrogen Electrodes! Send coupon for your free copy.

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Power Shovels • Crawler and Truck Cranes • Overhead Cranes • Hoists • Arc Welders and Electrodes • Soil Stabilizers • Diesel Engines • Pre-Fabricated Homes.

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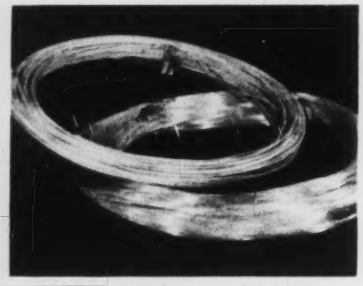
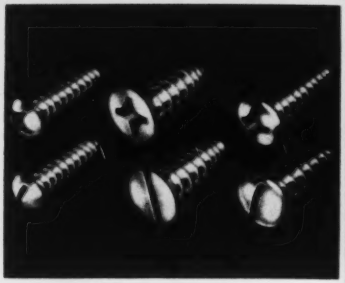
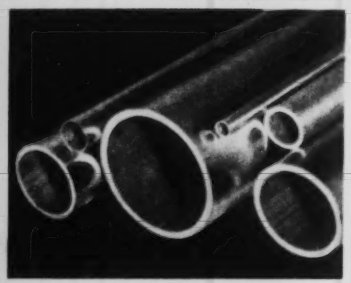


WIRE—Coiled and straight lengths; rivet wire, flattened and slit wire.

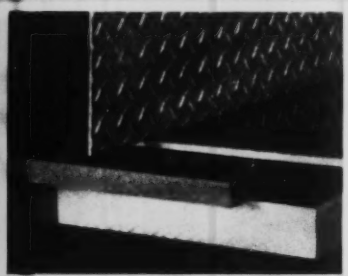


FASTENERS—Machine screws, wood screws, washers, nuts, bolts, rivets.

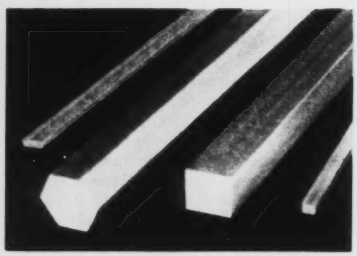


TUBE AND PIPE—Coiled tube; straight tube in round, square and rectangular shapes; heat exchanger tubes; standard pipe and pipe fittings; irrigation pipe; rigid conduit.

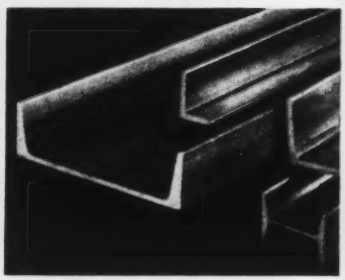
These are the MILL PRODUCTS *of* ALCOA



SHEET AND PLATE—Flat and coiled sheet, circles; patterned sheet; tread plate; roofing and siding sheet; roofing accessories and fasteners; specialty sheet.



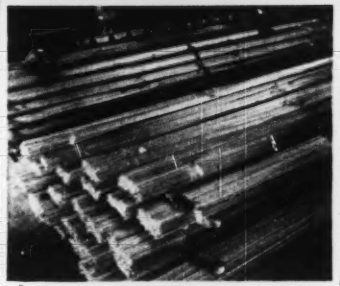
BAR STOCK—Square, hexagonal and rectangular bar stock in free-cutting and higher-strength alloys.



ROLLED SHAPES—Equal angles; unequal angles; channels; I-beams; H-beams; Tees; Zees.

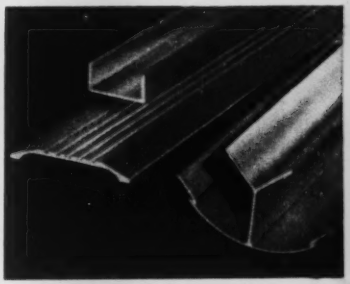
"SEE IT NOW" with Edward R. Murrow — CBS-TV every Sunday . . . brings the world to your armchair. Consult your newspaper for local time and channel.

ALUMINUM COMPANY OF AMERICA



SCREW MACHINE STOCK—All free-cutting alloys plus the higher-strength alloys—24S, 61S and 75S.

WELDING AND SOLDERING SUPPLIES—Welding and brazing wire, welding and brazing flux, solder flux, solder.



EXTRUDED SHAPES—Miscellaneous extruded shapes such as angles, channels, half rounds, quarter rounds, thresholds, truck corners, structural members, etc. Round, square and rectangular bars.

They have these 12 basic advantages and scores of others

- Lightweight
- High Resistance to Corrosion
- High Electrical Conductivity
- High Conductivity for Heat
- High Reflectivity for Light and Radiant Heat
- Workability
- Nontoxic
- Strength in Alloys
- Nonsparking
- Nonmagnetic
- Appearance
- High Scrap and Re-Use Value

With them goes the skill of 64 years' experience in fabricating, assembling and finishing aluminum

The world's greatest aluminum research and testing facilities are available to help you determine the suitability of aluminum for your products. And to train your personnel, Alcoa offers technical literature and how-to-do-it movies.

They are available from your local ALCOA sales office, distributor or jobber

For all possible co-operation in filling your orders, call your local Alcoa sales office, distributor or jobber. You'll find them listed under "Aluminum" in your classified phone book.

ALUMINUM COMPANY OF AMERICA
1808-L Gulf Building • Pittsburgh 19, Pa.

ALCOA ALSO MAKES PRODUCTS TO CUSTOMER SPECIFICATION

CASTINGS
sand, plaster, permanent mold and die

FORGINGS
drop, hammer and press forgings

EXTRUDED SHAPES

IMPACT EXTRUSIONS

SCREW MACHINE SPECIALTIES
special fasteners and screw machine parts

ALCOA *first in* ALUMINUM

Castings for today and tomorrow need constant improvement. A new help is now offered. Use of Rare Earth materials yields better, definitely uniform physical properties, and gives added assurance of meeting specifications.

A special product, "Rare-Met" T-Compound, developed by the Molybdenum Corporation, is most convenient and most thoroughly approved for use in both steel and nodular iron.

Having its own huge rare-earth deposits, the Molybdenum Corporation has devoted special research to these materials and can give advice on a wide variety of applications. You may wish to investigate.

As a supplier of Molybdenum, Tungsten, Boron, and other alloying materials, the Molybdenum Corporation welcomes correspondence on any requirement.

AMERICAN Production, American Distribution, American Control, Completely Integrated

Offices: Pittsburgh, New York, Chicago, Cleveland, Detroit, Los Angeles, San Francisco

Sales Representatives: American Steel and Supply Co., Chicago; Edgar L. Fink, Detroit; Brumley-Donaldson Co., Los Angeles, San Francisco

Subsidiaries: Cleveland-Tungsten, Inc., Cleveland, O.

Works: Washington, Pa.; York, Pa.

MOLYBDENUM CORPORATION OF AMERICA
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ON HOW TO CUT COSTS AND INCREASE PRODUCTION WITH

TOCCO INDUCTION HEATING

68 pages of up-to-the-minute information on a subject of vital importance to management men in metal-working plants. If you're interested in cutting costs, increasing production or improving your product, here's an opportunity to see how TOCCO is helping to accomplish these goals in some of the most important plants in America.

THE OHIO CRANKSHAFT CO. • CLEVELAND 1, OHIO

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☐ E — Case Histories—Brazing and Soldering
☐ F — The Case for TOCCO Induction Melting
☐ G — Induction Heating Equipment

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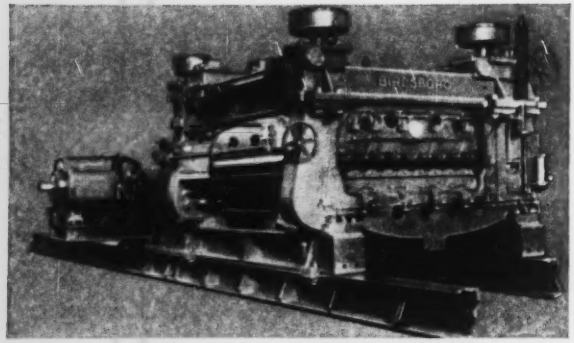


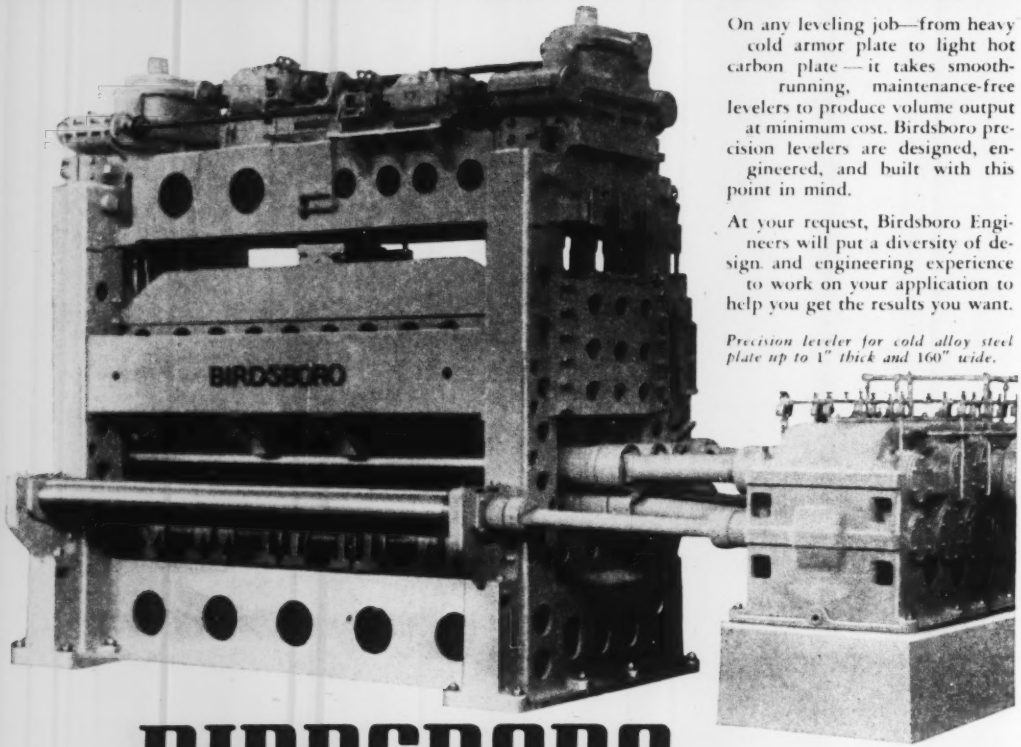
Leveling machine for hot carbon plate 5/16" to 1/2" x 100" wide.

STEP UP YOUR OUTPUT--cut down your costs

BIRDSBORO LEVELING MACHINES

On any leveling job—from heavy cold armor plate to light hot carbon plate—it takes smooth-running, maintenance-free levelers to produce volume output at minimum cost. Birdsboro precision levelers are designed, engineered, and built with this point in mind.

At your request, Birdsboro Engineers will put a diversity of design and engineering experience to work on your application to help you get the results you want.



Precision leveler for cold alloy steel plate up to 1" thick and 160" wide.

BIRDSBORO

STEEL FOUNDRY & MACHINE CO.

Birdsboro, Penna.

Offices in: Birdsboro, Pa. *and* Pittsburgh, Pa.

STEEL MILL MACHINERY

Designers and Builders of

Steel Mill Machinery • Crushing Machinery • Rolls
Hydraulic Presses • Special Machinery • Steel Castings

MM-28-52

What makes the SNORKEL PEN "breathe"?

Sheaffer's new Snorkel Pen created a sensation when it was introduced to the trade. Using air alone, the pen is emptied, cleaned and refilled through the filling tube of the Snorkel Pen with a one-stroke touch-down action.

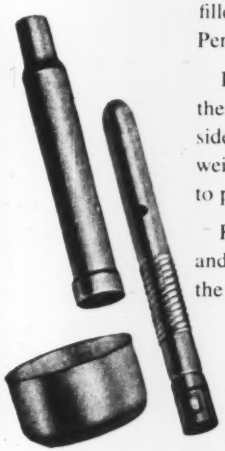
Designing the two brass "lungs" comprising the plunger-siphon mechanism called for considerable ingenuity. They must be light in weight, stiff and strong, easy to form and easy to polish and plate.

Formbrite* met all of these requirements—and more. With a metal thickness of only .0058", the 2" long cylinders are formed in multi-plunger presses in eight successive operations—*without annealing of any kind.*

Formbrite's superfine grain resulted in a harder, stronger, longer-lasting product with savings up to 50% in polishing costs.

Surprisingly, Formbrite, with all the plus values it offers over conventional drawing brasses, costs no more. See the reverse page for another application of Formbrite. And write for Publication B-39, addressing The American Brass Company, General Offices, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Limited, New Toronto, Ontario, Canada.

*Reg. U.S. Pat. Off. 5295



Cups like this, blanked and formed in one operation from Formbrite strip $1\frac{11}{16}$" x .0058", are magazine-fed into multi-plunger presses. Eight successive operations produce the sleeves illustrated at top of page *without annealing*. Sleeves at left are finished, ready for chromium plating.

Formbrite
is an
ANACONDA PRODUCT
Made by The American Brass Company

You can do this *better cheaper faster* IF THE METAL IS Formbrite

Since The American Brass Company introduced Formbrite* as a superior drawing brass, scores of stamping shops, polishing and plating rooms throughout the country have changed their thinking.

Comparative tests prove conclusively that the superfine grain structure of this specially processed forming brass means stamped and formed products that are stronger, harder, "springier" and more scratch-resistant. Yet the metal is so ductile that it can be readily formed, drawn and embossed.

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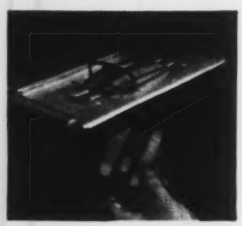
That's why we say you can do it *better, cheaper and faster* with Formbrite. Millions of pounds of Formbrite sheet and strip have been produced and economically fabricated into hundreds of different products. Want a sample—and more information? Address The American Brass Company, General Offices, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Limited, New Toronto, Ontario, Canada.

*Reg U.S. Pat Off

In the pressroom of a supplier, the back of a military brush is blanked from Formbrite red brass strip.



Empire Brushes, Inc., Port Chester, N. Y. produces an extensive line of military and clothing brushes with Formbrite components. At right, a decorative band is being applied.

Formbrite
is an
ANACONDA PRODUCT
Made by The American Brass Company

First Choice

OF THE AIRCRAFT INDUSTRY . . . H-P-M

"Eternal Vigilance is the Price of Liberty" . . . these words, today, have a deep, personal meaning to every freedom loving American. And, again, the aircraft industry plays an important role in furnishing the "eyes" to keep this vigilance and the "muscle" to deliver a telling blow for freedom, if the need should arise.

In the aircraft industry, like most other businesses, unbiased preference for a particular product or machine tool is based on performance and a high regard by the purchaser for the manufacturer's ability to build top-quality equipment.

H-P-M is proud that the majority of giant hydraulic presses, ranging in size from 5000 tons to 7000 tons, purchased by the aircraft industry, are H-P-M Fastraverse Presses. And, H-P-M is truly grateful to the aircraft industry for this overwhelming vote of confidence in our company and the presses we produce.

Through continuing research and proper application of the knowledge we have gained through 75 years of specialized experience in our chosen field, hydraulics, we shall endeavor to remain . . . *first choice of the aircraft industry!*

THE HYDRAULIC PRESS MFG. COMPANY

1044 MARION ROAD

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Builders of Presses for the Metal Working & Processing Industries • Plastics Molding Presses • Die Casting Machines • Hydraulic Pumps, Valves & Power Units

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whatever the application,

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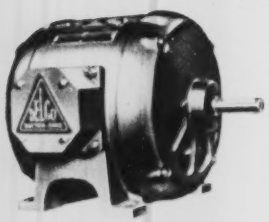
When your product requires the application of power—as a part of the product or to help make the product—you can be sure of complete satisfaction by choosing the Delco motor that's *built* for the job.

Every Delco motor that's made is engineered for the kind of *work* it has to do. It's made of the finest materials, and constructed to *stand up longer* under the roughest conditions.

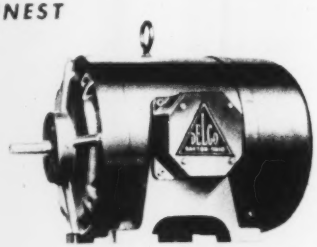
So get the facts on Delco motors *first.* You'll find Delco has the motors you need, and that Delco always meets its commitments. For complete details, write to Delco Products, Dayton, Ohio, or call the nearest sales office listed below.

DELCO FEATURES MAKE DELCO FINEST



OPEN BALL-BEARING MOTOR

TOTALLY ENCLOSED FAN-COOLED MOTOR



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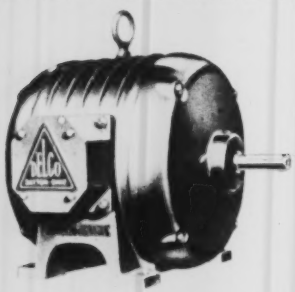
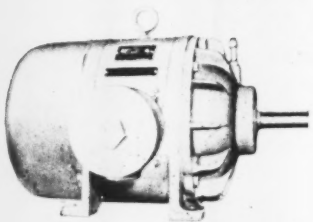


TOTALLY ENCLOSED MOTOR

EXPLOSION-PROOF MOTOR



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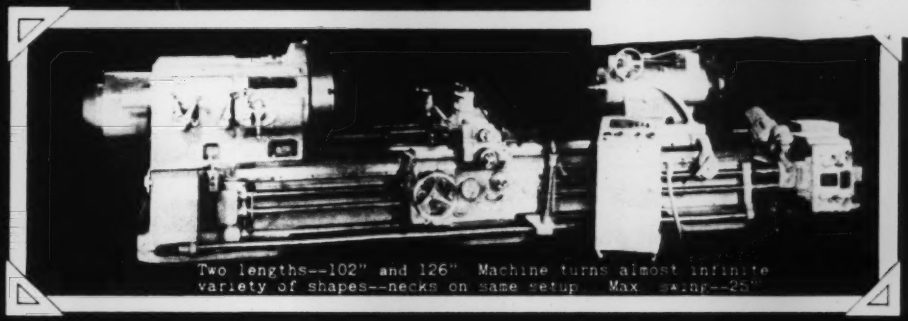
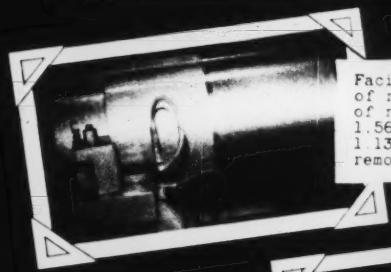
DIVISION OF GENERAL MOTORS CORPORATION, DAYTON, OHIO

A SNAP FOR STEEL PRODUCERS!

This Tracer-Controlled Monarch Heavy Duty Roll-Turner Produces 3 to 6 Times Faster! Offers Many Other Great Advantages.

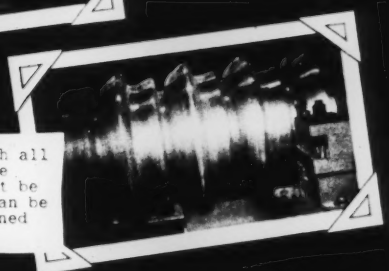


Two lengths--102" and 126". Machine turns almost infinite variety of shapes--necks on same setup. Max. swing--25".



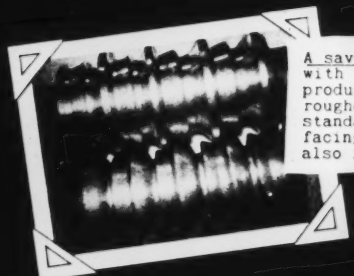
1st HOUR

Facing begun on first of pair of rail section rolls. Body of roll--40-1/2". Rolls are 1.56% carbon, 0.77% nickel, 1.13% chromium. Total metal removed, 3730 lbs. per roll.



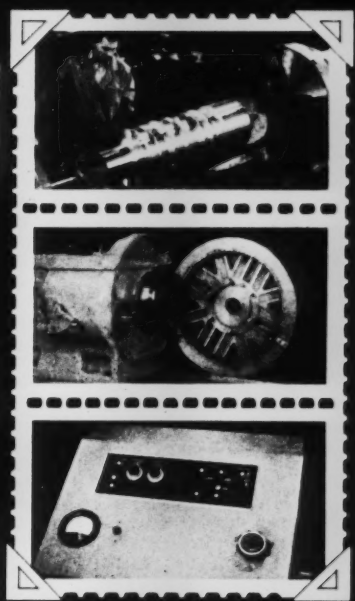
10th HOUR

Roughing completed. With all rolls from given template identical, rolls need not be matched in pairs. One can be redressed or new one turned with assured match.



26th HOUR

A savings of 99 hours compared with conventional roll lathe production. Both rolls faced, roughed and finished. Only standard carbide round nose and facing tools used--a huge savings also in form tool inventory.



TOP - Another typical operation.

CENTER - Face plate removed. Power applied far from work axis on large diameter rolls.

BOTTOM - Complete push button control exclusive with Monarch.

Focus on Monarch for all your turning needs

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TURNING MACHINES

ACCURACY • ECONOMY • LONG LIFE

FOR A GOOD TURN FASTER
...TURN TO MONARCH

THE MONARCH MACHINE TOOL CO., SIDNEY, OHIO
Please send me without obligation your complete illustrated Heavy Duty Roll-Turner Booklet No. 1302.

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COMPANY _____

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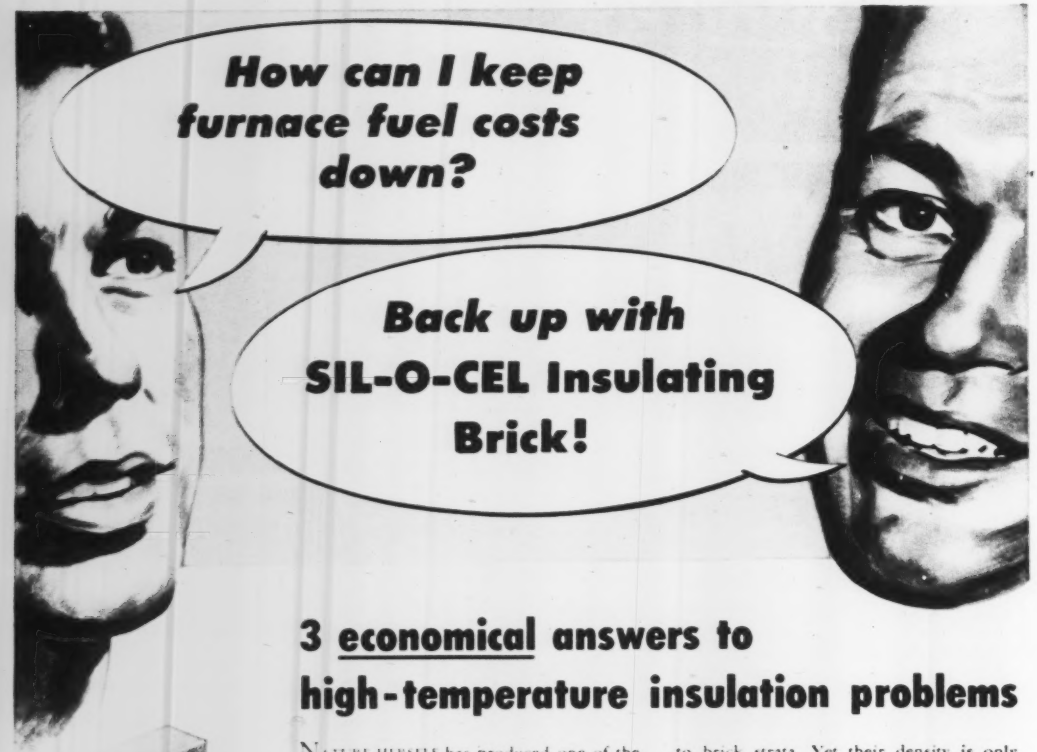
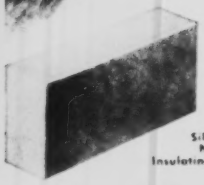


3 economical answers to high-temperature insulation problems


Sil-O-Cel Natural Insulating Brick

Sil-O-Cel C-22 Insulating Brick

Sil-O-Cel Super Insulating Brick

NATURE HERSELF has produced one of the most effective high-temperature insulating materials ever discovered—diatomaceous silica, from which Sil-O-Cel® Insulating Brick are made.

These insulating brick are used for back-up insulation behind fire brick or insulating fire brick linings in boilers, stills, stacks, heat-treating furnaces, kilns, lehrs, flues, retorts, and other types of high-temperature equipment.

Sil-O-Cel Insulating Brick have excellent insulating qualities combined with high load-bearing characteristics and light weight.

Made in all standard shapes of the 2½ in. and 4 in. series, Sil-O-Cel Insulating Brick are produced in three basic types:

SIL-O-CEL NATURAL INSULATING BRICK
for temperatures to 1600F

Quarried directly from one of the world's purest deposits of diatomaceous silica, these insulating brick have a conductivity of only 0.79 Btu in. sq ft F hr at 1000F mean temperature, with heat flow perpendicular to brick strata. Yet their density is only 30 lb cu ft. Cold crushing strength, 400 psi.

SIL-O-CEL C-22 INSULATING BRICK
for temperatures to 2000F

Ideal where high load-bearing properties are needed, this type of Sil-O-Cel is calcined, and has a cold crushing strength of 700 psi. Conductivity is 1.88 Btu in. sq ft F hr at 1000F mean temperature. Density, 38 lb cu ft.

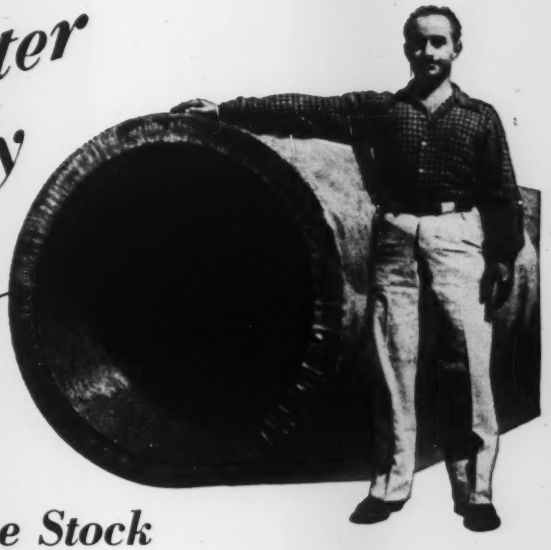
SIL-O-CEL SUPER INSULATING BRICK
for temperatures to 2500F

A calcined insulating brick for unusually high temperatures. In many cases, it is also possible to save on construction costs by reducing the thickness of fire brick or insulating fire brick when backed with Sil-O-Cel Super Insulating Brick. Conductivity is 1.95 Btu in. sq ft F hr at 1000F mean temperature. Density, 40 lb. cu. ft. Cold crushing strength, 300 psi.

For further information, write to Johns-Manville, Box 60, New York, N. Y. In Canada, write 199 Bay St., Toronto 1, Ont.

JM **Johns-Manville** *first in* **INSULATIONS**

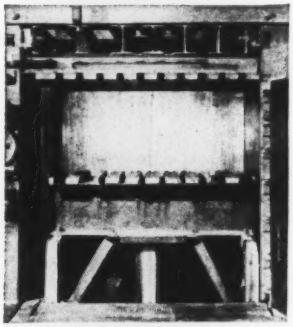
Now! Large diameter centrifugally cast tubing



Available from FRASSE Warehouse Stock

ACIPCO steel tubing, centrifugally cast, is now available from Frasse in sizes ranging from 2" to 50" O. D., wall thicknesses of ¼" to 4", in lengths up to 16 feet. The more popular sizes are immediately available from stock. Other sizes and analyses (in quantities as little as 16 feet) can be made to order promptly.

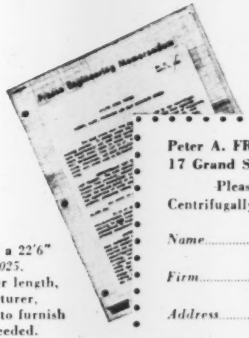
Government, ASTM, AMS, ABS, ACI and AISI specifications can be readily met. ACIPCO tubing is made in any standard or non-standard analysis. Steel used in its manufacture is produced in electric furnaces.



Fabrication of this hydraulic baling press required a 22'6" ram of AISI *1030*, and a 21'6" cylinder of AISI *1025*. ACIPCO tubing, circumferentially welded to proper length, was used successfully for both items. The manufacturer, Consolidated Baling Machine Co., relied on Frasse to furnish ACIPCO tubing in the size, length and analysis needed.

Typical applications for ACIPCO tubing include: Hydraulic cylinders, ship propulsion shafts, cracking still tubes, retorts, and paper mill rolls. In addition, it has received wide recognition as a component in weldment applications. Why not investigate the many advantages offered by this versatile product?

Frasse Engineering Memorandum #11 covers in detail the characteristics, properties, analyses and pertinent facts about ACIPCO centrifugally cast steel tubing. Mail the coupon below for your free copy today.



COMPLETE FACTS ABOUT ACIPCO CENTRIFUGALLY CAST TUBING

MAIL TODAY!

Peter A. FRASSE and Co., Inc. 64-JB
17 Grand St., New York 13, N. Y.

Please send me, without obligation, complete facts about ACIPCO Centrifugally Cast Steel Tubing.

Name.....*Title*.....

Firm.....

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Call FRASSE 1st for **SEAMLESS, WELDED AND CENTRIFUGALLY CAST STEEL TUBING**

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POWDER-WASHING SPEEDS CLEAN-UP

Removes excess and defective metal quickly, easily, and at low cost

Cleaning floor bottlenecks eliminated, production up, costs down, scraps and recasts negligible—that's the gist of enthusiastic reports on LINDE's powder-washing process.

Powder-washing combines the quiet speed of oxygen-cutting with a surface quality comparable to finish grinding. It removes fins, pads, sand inclusions, penetrations, burned core sand, chill bars, nails, chaplets, cracks and tears. It finishes flat or uneven surfaces to close tolerances with equal ease. And the powder-washing flame gets into places where other equipment can't.

Powder-washing can be applied to any carbon or alloy-steel casting. Equipment is simple. Technique is easily mastered in a short time.

For further details, telephone or write today. LINDE AIR PRODUCTS COMPANY, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y. In Canada: Dominion Oxygen Company, Limited, Toronto.

WHAT DO FOUNDRYMEN SAY ABOUT POWDER-WASHING?

"... powder washing does for us in two hours what required one day of chipping."

*

"An hour of powder washing has replaced four to six hours of grinding."

*

"Increased production and reduced labor and overhead more than make up for the cost of gases and powder consumed."

*

"... the equivalent of four days' chipping in one and one half hours."

*

"... a casting which formerly required one hour of grinding is cleaned by powder washing in less than five minutes."

*

"Powder washing cleaned one casting in an hour, the other in 30 minutes. Conditioning by chipping and grinding would have taken three and two days respectively."

*

"... removed the shifted cores and penetrations with a saving of several hundred man hours."

*

"... in a few hours, cleaned up housings that otherwise would have had to be scrapped."

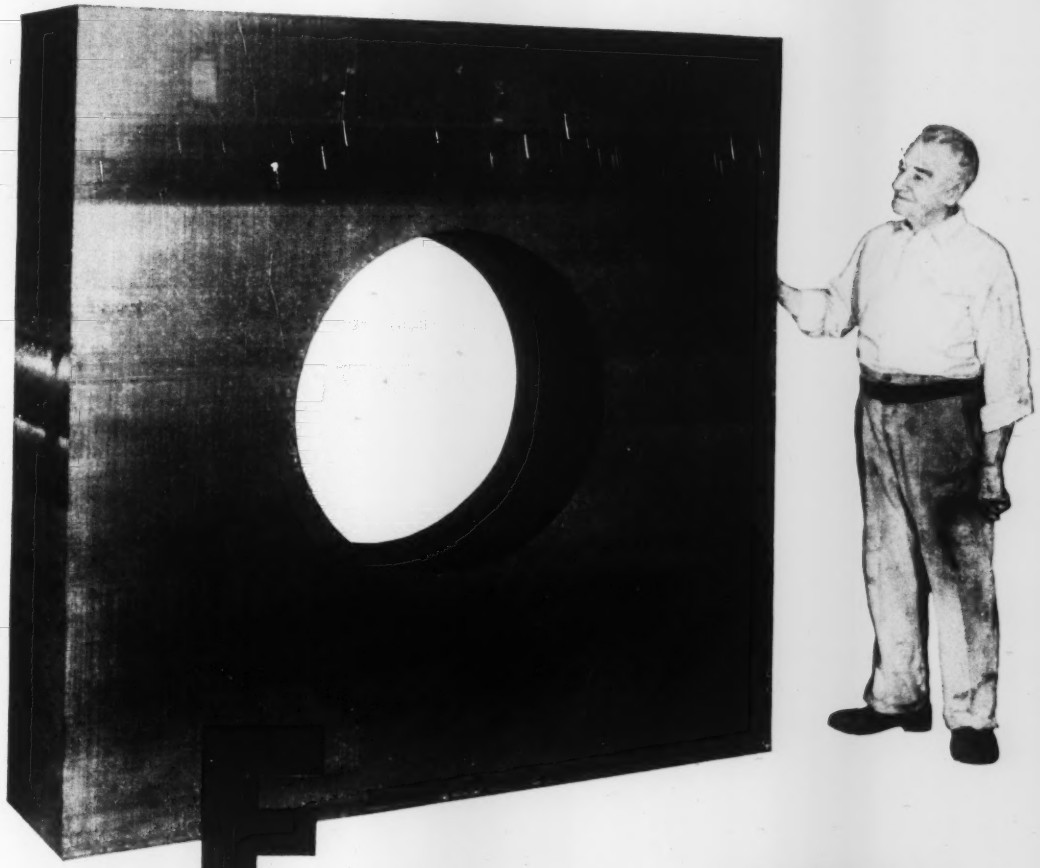
*

"... washed out a layer of sand from inside the cylinder in less than two hours, a job we could have done with no other available equipment."

LOOK TO *Linde* Linde Air

know-how . . . show-how . . . products and processes FOR WELDING, CUTTING, TREATING, FORMING METALS

The term "Linde" is a registered trade-mark of Union Carbide and Carbon Corporation.



Forgings by FINKL

. . . it's as simple as that to specify the highest quality forgings obtainable today. Quality based on **73 YEARS** of forging experience . . . **73 YEARS** of supplying the needs and meeting the demands of forging users large and small.

Between the ingot and you are Finkl craftsmen, employing the most modern equipment to shape, heat treat, metallurgically test, and rough or finish machine your forging . . . *between the ingot and you* are 73 years of knowing what to do to make that forging the finest you can get.

All this knowledge is available to you through Finkl Sales Engineers who will gladly offer their services when you want to talk forgings. *Call or write—*

MANUFACTURERS OF THE LARGEST FORGINGS IN THE MIDDLE WEST

A. Finkl & Sons Co.

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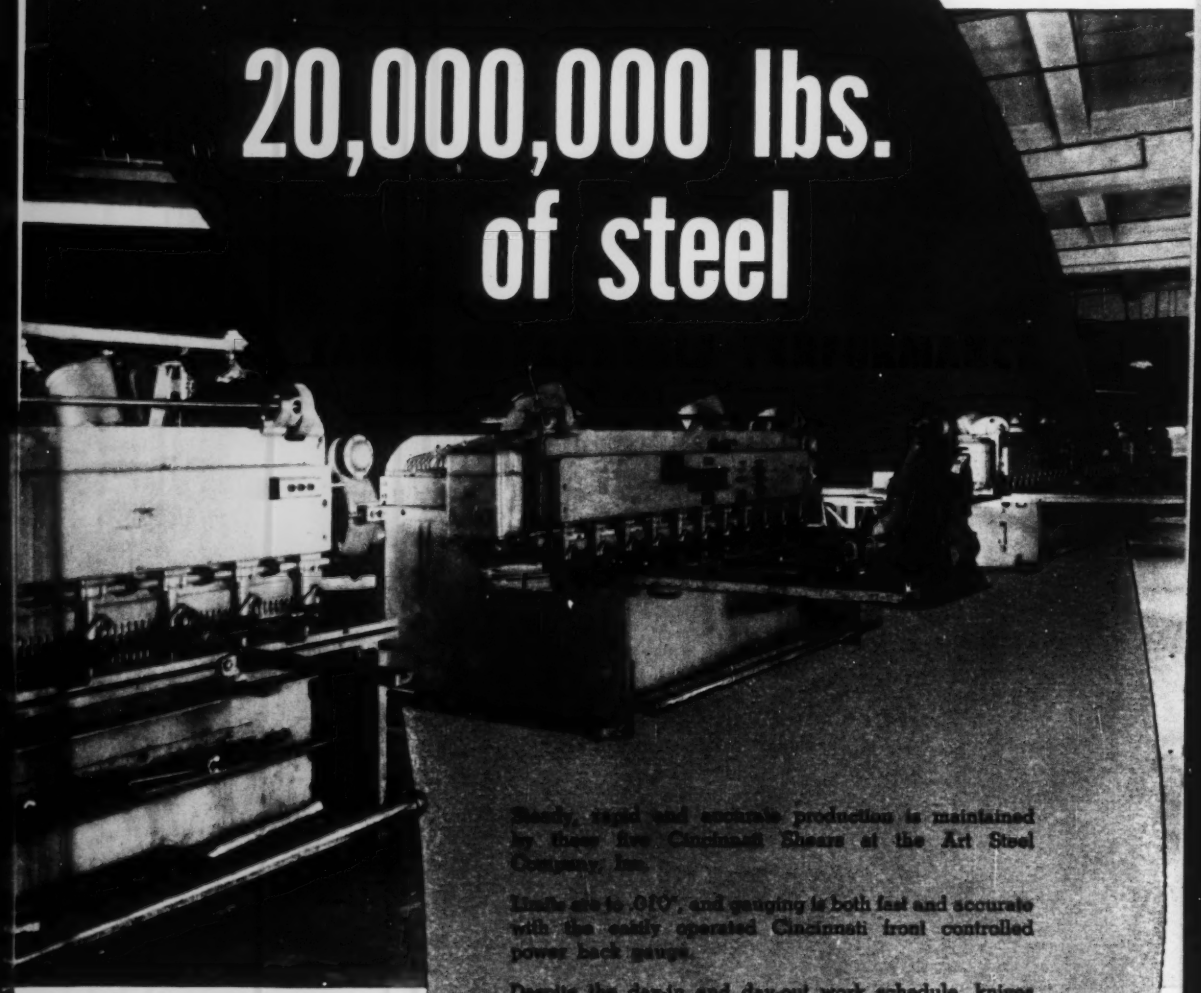
DIE BLOCKS & INSERTS • PISTON RODS & RAMS • SOW BLOCKS • CRANKSHAFTS

20,000,000 lbs. of steel



Photo—
Courtesy the Art Steel Co., Inc.,
New York, N. Y.

Steady, rapid and accurate production is maintained by these five Cincinnati Shears at the Art Steel Company, Inc.

Limits are to .010", and gauging is both fast and accurate with the easily operated Cincinnati front controlled power back gauge.

Despite the day-in and day-out work schedule, knives are sharpened but once a year.

Investigate these accurate, dependable Cincinnati Shears—you will find them profitable in your shop. Remember, straight-edged square blanks, accurate to size, are produced at low cost on these modern Cincinnati Shears.

Write for Shear Catalog S-6.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

CINCINNATI

The Metalworking Outlook

November 24, 1952

Decontrol: Uneven Headway

Plans for materials decontrol are making headway (p. 69) much faster than the lifting of price curbs. Even some government men have come up with a scheme for materials, although it is conservative. OPS has lifted and will continue to remove some price restrictions, but only on a hit-and-miss basis. Price Stabilizer Tighe Woods is even urging strengthening and continuation of his controls past Apr. 30.

CIO Politicking Soars

David McDonald, who last week was named acting president of the United Steelworkers of America, now has the inside track to win the position permanently. He has lined up the support of the district leaders, notably Joseph Germano, boss in the Chicago-Gary area. The union named an acting head to use its weight more effectively in the coming battle for the CIO presidency. It is cool to Walter Reuther, prefers Allan Haywood.

Plans for Aircraft

Military aircraft production will be maintained at a high level for several years. The tapering from its peak in 1955 when the Air Force goal of 143 wings is reached will be gradual. The Air Force has these four insurance policies against widespread cancellations of contracts which threw the aircraft industry into a tailspin after World War II: Production stretchout; production readjustment program seeking a more realistic evaluation of mobilization minimums of manpower, plant facilities, etc.; maintenance of permanent basic production facilities, war or no war; and contract maintenance whereby airframe and engine manufacturers can take on more military work.

Post-Defense Possibilities

Worried about what will happen to the economy when the peak in defense spending is past? York Engr. & Construction Co. and York-Gillespie Mfg. Co. in their *York Report* list these ten greatest post-defense possibilities for American industry: Fuel from atomic energy; electronic brains, push-button factories, the engineered home, television advances, the small car, new metal processes, advances in rare earths, antibiotics and farm chemicals and better plastics.

Emphasis on Production

The appointment of John G. Wood, former chief engineer for Chevrolet, as vice chairman of the Munitions Board means increased emphasis on military production, less on tooling, from now on. Mr. Wood is an expediter and production expert. He has just served a stint as consultant to the Aircraft Production Board.

Federal Finger in Research

Watch for even more federal funds for scientific research. Some 18 agencies which have scientific research and development funds going to nonprofit institutions made $341 million available in fiscal

Production-Engineering News—p. 97 The Market Outlook—p. 149

1952. That's $44 million above the $297 million granted in fiscal 1951. Defense Department funds comprised over 50 per cent of the total in each year, while Atomic Energy Commission accounted for about 35 per cent. The Federal Security Agency allotted almost 6 per cent, while remaining agencies accounted for only 9 per cent.

Resources Study Scheduled

There will be fireworks next Mar. 25-27 when Resources for the Future Inc. will hold a "citizens' conference" at Washington's Mayflower Hotel. It will be a public forum on Paley Commission proposals for an orderly expansion of our economic horizons. The proposals have met with reactions ranging from praise to denunciation. Particularly controversial are the commission's ideas to do away with protective tariffs and change the tax setup for domestic mining companies.

Housing: Better and Better

The housing construction picture looks better than ever. New starts for the first 10 months this year are 966,400, already comfortably above the level that some predictors thought would be the limit for the entire year. New starts for 1952 will be ahead of 1951, but below the record 1,396,000 begun in 1950. Of increasing significance this year are prefabricated home shipments. In the first nine months of 1952 they were 14 per cent ahead of the same 1951 period.

Straws in the Wind

OPS granted price increases to cover higher costs of foreign copper to manufacturers of certain products using small amounts of primary copper . . . Plymouth price reductions range up to $78 on new models . . . The new FTC chairman could be Lowell Mason, only Republican now serving on the commission . . . Titanium and its alloys will be produced in Britain by Imperial Chemical Industries; ore will be imported . . . The first iron ore imported to the U.S. from the Dominican Republic's small but rich body went to Barium Steel Corp.'s Chester, Pa., blast furnace . . . Tungsten distribution controls will be completely lifted soon . . . About 14,000 extra tons of foreign copper will go to users in December because DPA won't pay the price for the stockpile.

What Industry Is Doing

Decontrol of carbon steel products tops the agenda at today's meeting of DPA's Production Policy Committee (p. 69) . . . Supplies of carbon steel are rising as some industries need less (p. 70) . . . Metalworking sales in the first half rise 3.8 per cent over the same 1951 period, but profits skidded 15.1 per cent under 1951 (p. 72) . . . Shadow plants may loom high again, is the talk in Washington (p. 73) . . . Latin American nations with ore and coal underground are surveying opportunities for expanded steel production (p. 79) . . . Doehler-Jarvis Corp. and other die-casters expect 1952 industry sales to hold at $225 million (p. 81) . . .What's involved in the design and production of those shiny 1953 cars? STEEL gives a behind-the-scenes report on the new Dodge (p. 83).

METALWORKIN
OUTLOOK MET

This is another of the "HUNDREDS OF JOBS" which can be done on a MARVEL Band Saw!

MARVEL BAND SAW saved these two 4400 lb. castings

Two sand cores washed out when these giant 4400 pound steel connecting rods were cast, resulting in solid eye ends without gaps. Then came the $64 question—how to machine out the 1½" slots in the longitudinal center of the eyes which were 22" high and had a wall thickness of 6½".

The Ernest J. Nelson Iron Works of San Francisco, did this "impossible" job easily, quickly, and economically, without special tooling, on a standard Model #8M 2 MARVEL Band Saw. Two cuts were made in each rod in two hours per cut with tool cost of $3.06 per rod. The tool was a MARVEL B9-10 Band Saw Blade.

Every tool room, machine shop and maintenance department needs a MARVEL Series 8 Universal Band Saw—not only for innumerable everyday jobs but for the occasional "trick" operations, where its utmost versatility will save many headaches and dollars.

WRITE FOR CATALOG

MARVEL Metal Cutting SAWS
Better Machines Better Blades

These exclusive MARVEL Features made this job easy.

1. Large, T-slotted work table.
2. Blade feeds into work vertically; work always stationary.
3. Power-pressure feed.
4. Automatic Blade tension.
5. Built-in coolant system.
6. Large capacity.

ARMSTRONG-BLUM MFG. CO.

5700 BLOOMINGDALE AVENUE **CHICAGO 39, ILLINOIS**

SEND OUR CATALOG in

You'll enjoy *smoother sailing* with STRIP*

▸ ▸ ▸ when you need **COLD ROLLED STEEL** under 24 inches wide and especially 12 inches and narrower.

DEPENDABLE DAN

Do you make stampings, tubing or formed shapes?

Then you know that smoother sailing in production depends a lot on the UNIFORMITY of the steel you feed your presses, welders and rolling machines.

When you hit rough going due to troublesome variations in thickness, temper or surface quality, use Steel Strip. It will help make your work flow more steadily from set-up to finished product.

For greater UNIFORMITY is in the nature of Steel Strip. Its making follows stricter standard practices. You benefit from more restricted tolerances.

Take thickness. In strip the leeway averages only about half of what's allowed, say, for Sheet Steel.

Temper, too, is more closely controlled. Strip rolling and heat treating combine to give you temper ranges graduated from soft to full hard—to fit your job best.

In surface quality, you normally have your choice—either bright or "satin"—and consistently so.

*Please do not confuse STRIP with "SH-RIP" which is sheet steel cut into strip widths, in coils or otherwise. Any Reliance "Dan" will gladly tell you more about D S C STRIP.

FOR HELPFUL ACTION CALL OUR NEAREST PLANT OR OFFICE

DETROIT STEEL CORPORATION

PRODUCERS OF
Coke and Coal Chemicals • Pig Iron • Ingots
Slabs • Sheet Bars • Billets • Wire Rods
Manufacturers' Wire • Merchant Wire Products
Welded Fabric • Cold Rolled Steel Strip

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EASTERN PLANT, 2061 State Street, STate 7-5781, Hamden (New Haven 7), Conn.
MIDWEST PLANT, 1601 South Wolcott Ave., CAnal 6-2442, Chicago 8, Ill.

OFFICES
COLUMBUS 12, OHIO, 1373 Grandview Ave., Kingswood 9582
DAYTON, OHIO, 120 W. Second Street, Michigan 8581
DETROIT 28, MICH., 13770 Joy Road, WEbster 3-5866
GRAND RAPIDS 2, MICH., 326 Keeler Bldg., GLendale 8-9569
INDIANAPOLIS 4, IND., 1509 Fletcher Trust Bldg., FRanklin 2333
JACKSON 18, MICHIGAN, 801 Reynolds Bldg., Jackson 4-6180
MILWAUKEE 10, WIS., 4622 W. Center St., HIltop 2-1040
NEW YORK 19, N. Y., 250 West 57th St., COlumbus 5-4870
ROCHESTER 4, N. Y., 5 St. Paul St., BAker 1961
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The Only Hope

Last week letters received from servicemen on ships near Eniwetok described the weird scene of a bomb that exploded over an atoll in that vicinity. Later Gordon Dean, chairman of the Atomic Energy Commission, issued a statement referring to a series of tests, one of which included "experiments contributing to thermo-nuclear reactions." To specialists who ought to know what they are talking about, these signs indicate that our government either has perfected a hydrogen bomb or is close to having perfected one.

It is doubtful whether many people fully understand what this really means. It means that man has created a weapon so destructive that its use, in improper hands, could virtually destroy civilization on this planet. Moreover, it is a sobering fact that our own nation affords more substantial targets for super bombs of this kind than does any other country in the world.

In a very real sense it is unfortunate that we used the atomic bomb in World War II. It precipitated the scientific world into a mad race for improvement of the A-bomb and it rekindled the zeal to perfect the H-bomb. Now that we have A-bombs in the hands of at least two nations and the prospect that very soon there will be H-bombs, we suddenly realize that we have no organization on this earth that is capable of controlling these agencies of destruction. It is terrifying that the latest news of a possible H-bomb comes at a time when we find our United Nations at lowest ebb in strength and prestige.

As time goes on, it may become clear to people all over the world that their salvation lies chiefly in the formation of an international body that is strong enough to exercise a wise custodianship over these terrible weapons. Even after that realization becomes widespread, the problems of perfecting an international organization will be tremendous. They will involve matters more complex than any considered in forming the League of Nations or the United Nations.

The only hope is that the very shock of what the H-bomb means will cause men of good will to unite.

E. C. Shaner

EDITOR-IN-CHIEF

CONTROLS ON WAY OUT: Interest in ways of removing many unnecessary government controls is gaining momentum. Several influential groups which came out strongly for tight regulation of business shortly after the attack on South Korea now have completely reversed their position. For instance, last week CIO, which was one of the first organizations to

demand governmental controls on prices, issued a statement recommending that they be removed. On the same day the National Grange likewise asked for abandonment of controls.

While opinion on the wisdom of cutting out price and wage controls is almost unanimous, there still remains a strong feeling that some restriction on the allocation of certain materials must be retained. Therefore, the present thinking in regard to this phase of governmental regulation is to decontrol gradually. A tentative timetable (p. 69) has been prepared which, if adopted, would mean that by midyear of 1953 virtually everything would be in the clear except a few key items for defense and atomic energy needs.

* * *

SOUTH OF RIO GRANDE: Discussion at a recent meeting of the United Nations Economic Commission for Latin America (p. 79) revealed interesting information regarding the possibilities for the consumption and production of steel south of the Rio Grande. Seven nations—Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela—account for 87 per cent of the land mass and 81 per cent of the population of Latin America. With the completion of facilities under construction in Brazil, the steel ingot capacity of the seven countries will total 2,120,000 tons annually.

This is considerably short of the present indicated annual steel consumption in the area. The comparatively low levels and wide variation of consumption per capita—ranging from 15 pounds a year in Peru to 176 pounds a year in Venezuela—indicates that any substantial improvement in living standards would result in a marked increase in the demand for steel.

* * *

A MOTOR CAR IS BORN: Few persons in the metalworking industry appreciate the tremendous amount of work and expense involved in bringing out a new model of an automobile. L. L. Colbert, president of Chrysler Corp., estimates that the cost of designing, tooling and equipping its entire "F" series of cars exceeds $200 million. It is believed that as much as half of this amount was spent on work for the 1953 Dodge model alone.

One reason for the particularly high cost of bringing out the new Dodge (p. 83) is that Chrysler officials decided to incorporate in it a completely new V-8 engine. This necessitated the acquisition of a considerable number of machine tools. Unfortunately, government restrictions limited the amount of Dodge business that machine tool builders could take. As a result, arrangements were made whereby Dodge could build certain machines in its own plant. Dodge actually built almost a fourth of the major machine tools required to get its new V-8 engine in production. This is a remarkable feat.

UNSEEN POSSIBILITIES? Struthers Wells Corp. and Federal Machine & Welder Co. have jointly developed a machine which forms and welds cabinets for appliances automatically. The combination machine (p. 104) consists of a Struthers Wells tangent bender with a Federal welding component mounted on a beam which is raised and lowered with each machine sequence to make the forming operation possible.

Combining the forming and welding operations on a single machine has obvious advantages. Only one operator is required and valuable floor space—not only that occupied by a separate welding machine but also that required for storing unwelded assemblies—is saved. In view of what this machine accomplishes, one wonders whether or not there are numerous unexplored opportunities where the functions of two or more machines could be performed on a single machine to advantage.

* * *

NOVEL PLANE SERVICE: Youngstown Airways Inc. performs a novel service for companies desiring to provide company-owned airplane transportation. When a company signs up for this service (p. 74), Youngstown Airways buys a new plane, fits it to the company's needs, hires a competent pilot, provides hangar space, takes care of insurance and attends to all other details. The company simply notifies Youngstown whenever one of its officials wants to make a trip.

The advantages of this arrangement are lower cost, freeing the company of numerous details and a more effective control and supervision of pilots. It is believed there is merit in the idea that the pilot be responsible to someone other than the man he is flying with. It is pointed out that the temptation of the boss to ask his pilot to fly when it is against the latter's better judgment always is a risk.

Thanks, too—For the unseen blessings

Traditionally, our American Thanksgiving marks the end of another harvest time . . . a day for feasting, for giving thanks for the fruitfulness of the wonderful land in which we live.

But still more precious than the earth's bounty are those inalienable gifts of citizenship—the right to choose our way of life, our work, our way of worship. Today, as never before, these freedoms that belong to every American stand forth as shining cause for heartfelt gratitude.

So again we pause to express our thankfulness for our friends and country. And in these troubled times we are especially grateful for the spiritual and material strength which has preserved our rights throughout the past and will defend them in the future.

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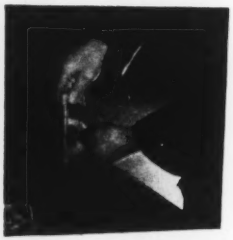
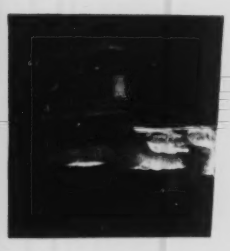
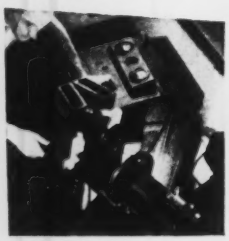


keeps steel quality consistently high.



These checks...made all through



production...demonstrate how.

INLAND STEEL COMPANY
38 South Dearborn Street, Chicago, 3, Illinois

Decontrol Track Clearing

Now that even the CIO favors an end to restrictions, government planners come up with a conservative plan for gradual decontrol which would keep the nucleus of CMP

DECONTROL of carbon steel products on the basis of the accompanying timetable and new mobilization legislation to take the place of the Defense Production Act—those two matters will top the agenda of DPA's Production Policy Committee when it meets today, Nov. 24.

About five decontrol plans are now in existence, including one prepared by the Steel Decontrol Subcommittee of the steel makers' industry advisory group. One of the latest represents the thinking of William C. Truppner, deputy DPA administrator for production controls and chief architect of the current CMP.

The Reason Why—His ideas have some chance for acceptance because they are backed by the men who will initiate the decontrolling, although not by all other federal groups that have a stake in the matter. One purpose of today's meeting will be to get wider support around Washington for the DPA staff ideas. Steel industry's approval also will be sought, as will that of small business.

Support may be lukewarm in some quarters because the plan has been worked out for carbon steel products only, on the theory that once the decontrol pattern is fixed, it can be made applicable later to alloy and stainless steel, copper, brass and aluminum. The current proposal also abandons an earlier plan for the maintenance of a standby CMP. Instead, it calls for: Maintenance of a full CMP operation with related priority authority for the military and atomic energy programs only; a substitute set of a few allocation procedures for specific metal products—even a carbon steel item or two—which remain tight; and periodic compulsory reporting by metal consumers. The aim of that last proposal is to provide information on metals consumption to permit the prompt resumption of CMP in case of an allout war.

Limited—The DPA staff argues that CMP must be kept for the military and AEC because those programs for the next fiscal year are so big that they cannot be implemented through the use of simple priorities without creating a serious impact on the civilian economy.

To keep CMP for the military and AEC after next June 30 requires congressional approval. These are DPA staff recommendations for new legislation:

1. Broad authority to allocate materials as contained in the present act—with a quantitative limit on the exercise of the authority. Thus, allocations and priorities would be possible only when the military and AEC take is 10 per cent or more of estimated supply of any specific products. In such cases, all materials users could be programmed.

2. An amendment which would bar the extension of assistance to civilian and defense-supporting programs where the military and AEC take is less than 10 per cent of estimated supply.

3. Permission to give spot assistance to individual construction projects and production schedules outside of military-financed programs only on the basis of specific

PROPOSED TIMETABLE

☑ DECEMBER . . .

Open-ending of CMP for the first quarter for most carbon steel products.

Claimant agencies develop requirements for specific steel products likely to be short after June 30.

Second-quarter CMP allotments will be determined.

☑ JANUARY . . .

Consumers will get second-quarter — and probably their last—CMP tickets.

Formal announcement of the future of controls for the second half.

☑ FEBRUARY . . .

Open-ending of CMP for the second quarter for most carbon steel products.

☑ MARCH . . .

Decision on what few steel products ought to be allocated in the third quarter, as determined by claimant agency requirements.

☑ APRIL . . .

Indefinite continuation of CMP, subject to the will of Congress, for the military and AEC.

Cancellation of all outstanding advance allotments for carbon steel products — other than those that fall into the military or AEC programs and other than those few products that are still judged tight.

Allocation system arranged for those steel products remaining under control in the third quarter; it won't be CMP.

Establishment of a mandatory reporting system to serve as a basis for prompt return to CMP if the need arises.

☑ JUNE 30 . . .

End of allotment controls on carbon steel within the framework outlined above.

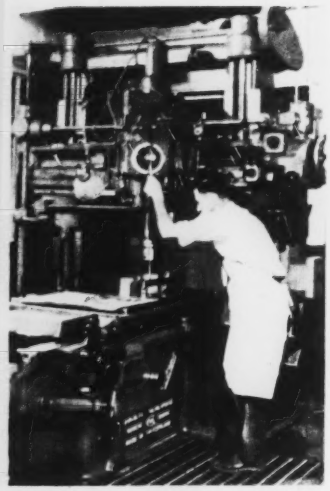
military and AEC endorsement.

What It Means—If Congress goes along with those proposals, a closed CMP for the military and AEC would mean: Continuing production and construction schedules with allotments of steel, copper and aluminum and preference ratings for related products to military and AEC prime contracts whose jobs are identified under the symbols A, B, C or E; continuation of current set-asides on the steel mills and the establishment of similar set-asides for copper and aluminum as a means of spreading the load; maintenance of a government framework on a continuing basis for quick expansion of military and atomic energy production and construction; and the core of a staff in Washington to handle allotments in case a full program is needed again.

DPA decontrol proposals are decidedly conservative. They have the disadvantage of setting up the nucleus of what could easily be a permanent controls plan. The 10 per cent criterion proposed as the boundary line between using or not using controls on metal for nonmilitary and non-AEC projects is often difficult to determine and could provide an easy wedge by which to reimpose controls. Indeed, planners at the start hint they will use the 10 per cent boundary to keep controls on some tight carbon steel products, such as bars. Finally, DPA staff proposals have the serious drawback of offering no specific times for decontrol of copper and aluminum.

The Positive Side—But the plan has some merit. It offers a method of gradual decontrol, which many metal producers and users now agree is essential. It offers a practical approach to the mechanics of decontrol; it shows a realistic way of letting go of the bear's tail. It is backed by career officials who, even under General Eisenhower, probably will continue to have a hand in carrying out decontrol. And it sets up a quick way to resume controls if needed.

Steel industry's official proposals differ from federal planners on two big points: They call for decontrol of all steel products with no 10 percent rule, but allocations for the military and AEC, and they advance the timetable one quarter.



Swiss Borer is Precise

Oldsmobile Division, General Motors Corp., ordered this Swiss-manufactured jig boring machine for precision operations on precision tools. In Oldsmobile's Lansing, Mich., tool room, the machine helps guarantee extremely high precision tolerances in tools used in manufacture of Rocket engines. The base is set in concrete, while a wall of gravel protects the base from shock

Why Decontrol?

In making second-quarter determinations CMP planners find steel supplies up, needs down

DPA IS NOW matching supply estimates against stated requirements of 53 claimant agencies for second quarter next year. The decision, due about Dec. 15, may be the last under the current Controlled Materials Plan. The heat's on to lift carbon steel controls.

Shifting Factors — Reason for the heat shows up in preliminary estimates for next April, May and June. Supplies are expected to exceed 21 million product tons up almost 2 million tons from estimated production in the third quarter of this year, before the strike. First statements of requirements are down almost 700,000 tons below comparable figures for the third quarter. They now total about 125 per cent of supply.

That 125 per cent figure is actually deceptive, though, because the totals include both plate and structural, where demand is substantially more than supply. Demand for structural is expected to top 150 per cent of potential supply. For some steel products, there's more than a little chance supply will be in excess of need.

Overlooked? — Current figures apparently don't take into consideration unfilled orders which will be carried over from the first quarter, nor do they consider changes in inventory regulations due about Jan. 1 which will increase the take.

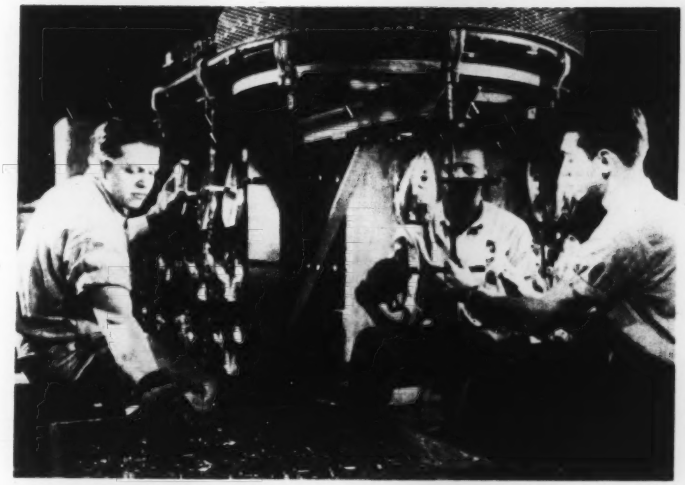
The whole military program constitutes another headache. First statements of requirements show an increased demand for almost all controlled materials. Aside from normal attrition, these figures will probably stand if there is no decision to "stretch out the stretch-outs" when the budget requests are reviewed after inauguration.

Unknown Factors—Since the second quarter allotment calls for the production of military end-products late next year, a stretch-out would mean a substantial reduction in the military phase. It would find DPA looking for potential users of metal in much the same fashion as it did early this year. However, at that time the industrial expansion program represented a solid base on which to operate CMP. Now, nobody knows for sure what the defense program will look like next year and much of the expansion is completed.

Program planners are faced with two other imponderables. The first is a substantial drop in the supply estimates for aluminum accompanied by a sharp rise in stated requirements. Current estimates indicate that requirements total about 145 per cent of supply.

Follows Steel—The second imponderable is copper. While requirements still appear to be in excess of supply estimates, the program makers would normally expect to strike a balance between supply and control demand. However, they are worrying about the uncertain supply of copper raw materials including scrap, which could force a revision of the supply estimates downward.

Still a further worry stems from the fact that easier supplies of carbon steel for the automotive and consumer hard goods industries is bound to boost pressure on copper and aluminum.



A dreary 1952 sales picture changes as . . .

Platers Brighten Up with More Nickel

NPA's recent relaxation on the use of nickel by electroplaters was a turning point for many job shops. They're better off now and the prospects look good

JUST 0.00005 of an inch separates many job electroplaters from disaster.

That distance represents the average thickness of the nickel "strike" permitted by NPA for undercoating in bright finishing. Just two months ago, on Sept. 3, the government relented and amended M-80 to permit slightly more nickel to be used in plating. That move has proved a turning point in the plating business and places the estimated 3500 job platers, plus the captive shops, on the same footing of nickel usage as the vitreous enamel and silver plating shops.

Out of the Vale—With increased activity among their civilian customers — automotive, appliance, electrical components — job platers now believe sales this year will be equal to or only a little below sales last year. The National Association of Metal Finishers Inc., Washington, says job platers' sales were drastically under the first half of 1951 during the first six months of 1952 (1951: $7,918,218-1952: $6,055,408), but the third quarter sales of the two years were about equal (1951: $1,721,915-1952: $1,529,380). And the upward trend seems to be continuing this quarter. F. C. Taormina, Master Electro-Plating Association Inc., New York, reports jobbing shops there operated at 70 per cent of manhour volume in October. Operations for the year are estimated as being about 62 to 65 per cent.

When nickel went under tight restrictions, platers searched hurriedly for substitutes in the standard copper-nickel-chrome plating series. Various combinations were tried — a heavier deposit of copper plus chrome, chrome directly on steel and white brass (a copper-zinc alloy). Stainless steel replaced plated parts in a limited number of applications.

Fooling Around — But, most platers, like David Droze, general manager, East Liberty Electroplating & Refining Co., Pittsburgh, found: "You can't chrome plate without nickel. If you do, you are just fooling the public or fooling your customers."

Net result was that jobbing platers turned to defense work, which is mostly corrosion preventive and does not require chrome, or cut back to the bone. Only after the recent easing of restrictions on nickel have jobbers been able to partially return to normal.

Finished Story — Currently the composite automobile (the automotive industry is probably the job plater's best civilian customer) sports these finishes on its components: Stainless steel for belt moldings, hood moldings, radiator grille (horizontal bars), windshield wiper arms, large wheel covers, and door lock covers; chrome plate, using the copper-nickel-chrome sequence, for bumpers, bumper guards, door handles, truck handles and hub caps; chrome plate, but without nickel and protected by baked-on enamel, for parking light bezels, tail light bezels, hood ornament, radiator grille (vertical bars), name plates, windshield division bar, headlamp rims and license light housing.

The outlook is brightening in the automotive field as elsewhere. There seems to be no permanent trend away from plating.

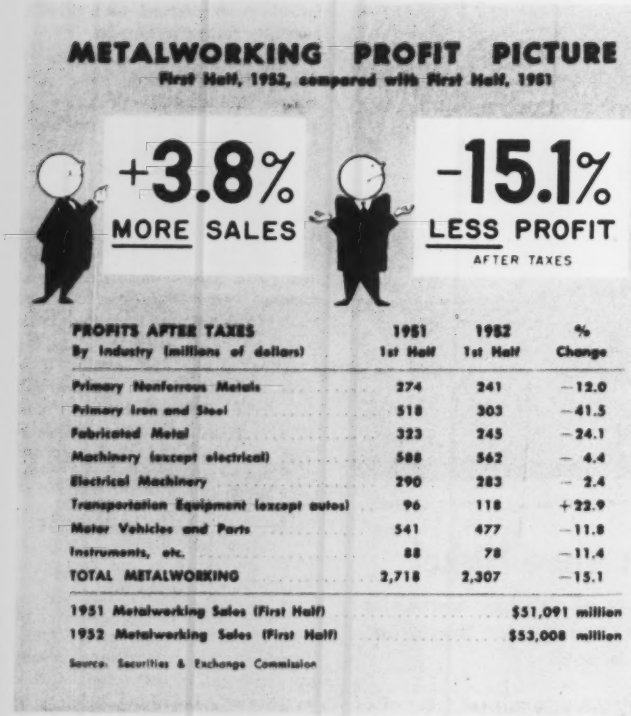
While NPA holds out no immediate hope for further relaxation of nickel restrictions, platers can now get 25 per cent of their base period (Jan.-June, 1950) usage of nickel over and above military requirements. And as one Ohio plater puts it: "We just completed a substantial addition to our office and plant. Would we do that if we didn't think business was going to get better?"

New Motor Standards Approved

Revised standards for electric motors have been approved by the Motor and Generator Section of the National Electrical Manufacturers Association. NEMA's Suggested Standard for Future Design provides for more horsepower output in a given frame size and applies to polyphase, squirrel-cage, 60-cycle, open, 4-pole motors, rated from 1 to 30 hp.

NEMA estimates the smallest diameter motors will become generally available by Jan. 1, 1954, to be followed at about five month intervals by the larger frame sizes. Completion of the program is expected by late 1955.

Standards approved by NEMA are voluntary and any motor manufacturer is free to use, or not to use, these suggested standards.



PROFITS AFTER TAXES By Industry (millions of dollars)	1951 1st Half	1952 1st Half	% Change
Primary Nonferrous Metals	274	241	−12.0
Primary Iron and Steel	518	303	−41.5
Fabricated Metal	323	245	−24.1
Machinery (except electrical)	588	562	− 4.4
Electrical Machinery	290	283	− 2.4
Transportation Equipment (except autos)	96	118	+22.9
Motor Vehicles and Parts	541	477	−11.8
Instruments, etc.	88	78	−11.4
TOTAL METALWORKING	2,718	2,307	−15.1

1951 Metalworking Sales (First Half) ..... $51,091 million
1952 Metalworking Sales (First Half) ..... $53,008 million

Source: Securities & Exchange Commission

A Lesson in Economics—

Produce More To Earn Less

THE POT OF GOLD is still at the end of the rainbow for hustling metalworking firms.

Caught on a treadmill of rising costs and high taxes, their probable record sales of $106 billion this year may leave them farther behind profitwise than they were last year with a sales volume of only $100.3 billion.

Deadly Duo—Two factors are doing the most damage to metalworking in its quest for adequate earnings: Rising labor costs and federal activity in the fields of price curbs and taxes. The two, in combination with the steel strike, were especially disastrous. Industry output was able to recover from the shortage of steel with remarkable quickness once the strike ended, but the round of wage increases continued. Despite the government's alacrity in permitting the partial pass-through of the base metal producers' wage increases, it denies the same proper price increases to other industries which were forced to grant wage hikes. The resulting squeeze has played mayhem with labor costs.

There's one irony in the situation: The government won't get such a big tax take this year. During the five years from 1946-51, the average steel company's income tax increased 854 per cent — nearly 65 per cent of the steel industry's taxable income in 1951. This year the government will have less to tax because the profit of corporations *before* taxes has dropped—over 6 per cent from the first quarter to the second quarter of this year.

That's the picture for metalworking as a whole, but a few scattered companies have successfully bucked the tide and will post record earnings for the year commensurate with their record output.

Cost Emphasized — But the reduction in profits for most can be attributed to rising costs without compensating price increases while the tax load continues to exact the same heavy toll from industry's thinning remainder.

As the year in which industry worked the hardest draws to a close, metalworking executives find themselves armed with incredibly incongruous profit statements. The new administration will get a look at them early next year, and industry hopes they will be better understood than they have been in the past.

Plant Needs No NPA Funds

No government funds will be involved in construction and equipping of Kearney & Trecker Corp.'s proposed machine tool plant near Milwaukee, although DPA has issued a $5,232,000 certificate of necessity to permit a five-year amortization. Kearney & Trecker is free to accept orders from any source and anticipates much nondefense production.

Under present schedules, the plant will be finished in July, 1953. More than $2.5 million worth of machine tools, including about 60 large units, will fit into the 193,000-square-foot, single-story building. Annual output will be about $5 million at first, although production can be doubled.

Decision to build the plant was motivated by the need for heavy machine tools to machine die blocks used in production of giant forging presses for making large plane components. Tools must also machine gigantic parts forged by the presses. For those uses, Kearney & Trecker will build machine tools weighing as much as 250 tons at its new plant.

Weirton Plans More Coke

Production of coke will soar at Weirton Steel Co., Weirton, W. Va., after completion of a planned $24,750,000 coke plant.

Weirton, a division of National

Steel Corp., will erect two 41-oven batteries and an extension of coal handling facilities. The project is approved for fast tax write-offs and will increase the company's coke production from 2000 to 5000 tons daily.

Meanwhile, Crucible Steel Co. of America announces 29 new coke ovens are in operation at its Midland, Pa., works. Added to 184 ovens already in service, the new arrivals will bolster annual coking production from 675,000 tons of metallurgical coke to 832,000 tons. The ovens may be under-fired with coke oven or blast furnace gas.

Crucible plans a new blast furnace which will utilize the increased capacity. Additional coke production will also boost production of the coke plant's coal chemicals division.

Barium Steel Buys Tube Mill

Barium Steel Corp. will install a rotary forging seamless tube mill at Phoenixville, Pa., to produce 180,000 tons of 5½-inch to 13⅜-inch diameter oil well casing and heavy wall pressure tubing in lengths up to 60 feet. The mill, purchased from Pittsburgh Steel Co., is now being dismantled prior to shipment.

An Italian authority on seamless tube plants, Dr. Albert Calmes, will engineer the new plant to meet modern requirements for oil casing and tubular products. A. J. Boynton & Co., Chicago, will act as consulting engineers in the modernization and alteration program.

Copperweld to Buy Tube Firm

Copperweld Steel Co., Warren, O., is arranging to buy all outstanding common stock of Ohio Seamless Tube Co., Shelby, O., for $8,650,000. The purchase will provide Copperweld with a tube mill to handle some of the semi-finished steel from its Warren plant.

Frank R. S. Kaplan, Copperweld president, said the company has arranged for a $5 million bank loan and for sale of $3.5 million worth of Copperweld convertible preferred stock to a group of investment bankers. He said that no changes in personnel and management are planned, although the two firms may be combined later.

Shadow Plants

Empty Factories To Mitigate Dislocations of All-Out War

EARLY ACTION is expected in Washington on at least some of the "shadow" plants that may be erected and equipped to fill gaps in the industrial mobilization base.

Shadow plants would be equipped with machinery bought and owned by the government and leased to the plant owners, to be held in standby for use in an all-out war. While similar efforts after World Wars I and II were not markedly successful, mobilization agencies now seem intent on bringing the plan to fruition.

Christmas Rush—The Bureau of the Budget is holding hearings to determine not only which shadow plants to approve under existing appropriations but which to recommend for action by the next Congress. In the Office of Defense Mobilization, the Vance committee has stepped up its studies on shadow plants and future machine tool needs. Report of its findings and recommendations probably will be heard before Christmas.

Defense Production Administration officials are struggling with one of the knottier problems in which the program is snagged: What percentage of the investment in these shadow plants is to be allowed for fast amortization?

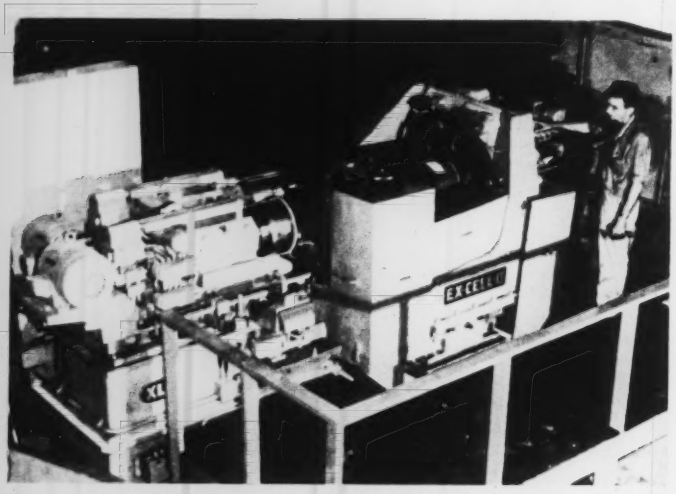
No, Thank You — Some companies declined to erect shadow plants on the basis of 70 per cent fast amortization. Indications now are that fast depreciation will be allowed on at least 90 per cent and possibly 100 per cent of the investment. DPA is preparing a new form of certificates for shadow plants which will be unlike those for plants built to execute a definite military contract.

Included in the shadow plant program are two types of facilities —those to produce military end-items and those for making machine tools and related equipment which are subject to long lead-time in mobilization periods. Among shadow plants slated for an early go-ahead are several for producing large and special machine tools. Contemplated are a number of gage manufacturing plants since present gage capacity is inadequate to meet full mobilization demands. Whether these plants would be owned by the Defense Department or private firms remains a moot question. In either case, they would be operated with government-owned equipment.

To Each His Own — Under a present proposal, still being talked around, equipment for shadow plants, as well as government-owned machine tools generally would be shipped to the builders for storage, maintenance, and modification to meet future needs. Under that proposal, builders would make their own deals with used machinery rebuilders.

The idea of a broad program for machine tool and related equipment stockpiling has been knocked flat. If there is to be machine tool stockpiling, it will be confined to tools specifically earmarked for production of designated items in designated plants. But, proposals to stockpile long-lead-time components such as special bearings continue very much alive.

Awaits Co-operation — Will industry co-operate in extra safety measures for future mobilization? John F. Gordon, vice president of General Motors Corp., said in speaking of dual-purpose plants in particular and an industry program for future defense needs in general: "There are units of industry which have gained enough experience in the last 10 years under the present plan that would likely be willing to co-operate in such an effort if Congress and our defense agencies are interested and willing to undertake their respective shares of the problem."



Tool Techniques Turn to Jet Production

Solar Aircraft Co., San Diego, Calif., ordered this 19-ton unit to apply high-production, special-purpose machine tool techniques of the automotive industry to manufacture of jet engine parts. The boring and facing unit cuts 87 per cent from time previously required for internal machining on J-47 jet engine aft frames. It replaces three vertical turret lathes used for aft frame internal machining

Flying High: Company-Owned Planes

Youngstown Airways Inc. has a service plan which takes most of the pain out of owning and operating a company plane for executive trips

ZOOMING UP with one of the brightest futures in post-World War II aviation are flying trips by executives in company-owned airplanes. Youngstown Airways Inc., Youngstown, O., has come up with a unique system for eliminating most of the pain of owning and operating those company planes and for actually saving money in the bargain.

When a company signs up, Youngstown Airways buys a new airplane and fits it to the customer's specifications. The customer pays one-third down of the plane's cost. Another third of the cost, plus operating expenses, is billed monthly. At the end of a year, the customer has the option of buying the plane, by paying the remaining third of the purchase price, or he can sell it and drop out or buy a new plane. Most companies get new planes.

One Demand—The real value to the customer-company is not in buying the airplane but in services. Once the bills are paid, the only demand upon the participating company is to tell Youngstown Airways where and when a company executive wants to fly.

Airways' service works like this: It picks a competent pilot for the company's plane and makes sure the man stays competent; it handles insurance; it keeps the plane in top condition and provides gas and oil for trips; it provides hangar space for the plane; it makes sure all license requirements are complied with; it keeps an eye on the weather maps and makes sure the passenger gets to the nearest good airport to his ultimate destination.

Alternative — Youngstown Airways operates 14 executive planes under the plan. "And most of them," says F. S. Beckett, president of Airways, "at two-thirds or three-fourths the cost if the companies tried to hire their own pilots and handle their own problems."

Mr. Beckett believes the heart of his service is the pilot program. Pilots are checked carefully before they're hired and then must take additional training at regular intervals. Airways has a Link trainer which is required training in the program. Pilots must also "Link out" in advance any particularly difficult flights.

Accident Prevention — There's a big advantage in having the pilot responsible to someone besides the man he is flying around. Mr. Beckett points out that the boss forcing a pilot to fly against the pilot's better judgment is one of the major causes of industrial plane accidents. At that, industrial flying has one of the better safety records.

Among the companies for which Youngstown Airways operates a company plane are Copperweld Steel Co., Wean Engineering Co., Wean Equipment Co., McKay Machine Co., Packard Electric Div. of General Motors Co., Cold Metal Products Co., Youngstown Manufacturing Inc., McCullough Transfer Co., Heltzel Steel Form Co. and Peerless Electric Co.

CHECKLIST ON CONTROLS

Materials Orders

MACHINE TOOLS — Amendment of Nov. 17, 1952, of NPA Order M-41 changes the percentage split of machine tool production between military and civilian purchasers from 70 per cent military and 30 per cent nonmilitary to 60-40, except as to those critical tools listed in Exhibit D of M-41. It also

SELECTED DEFENSE CONTRACTS IN EXCESS OF $100,000

PRODUCT	CONTRACTOR
Turret Lathes	Bullard Co., Bridgeport, Conn.
Light Trucks	General Motors Corp., Detroit
	Willys-Overland Motors Inc., Toledo, O.
Motor Vehicle Parts	Detroit Aluminum & Brass Corp., Detroit
Shells, 76 mm.	Cobusco Steel Products Div., Colorado Builders & Supply Co., Denver
Shells, 105 mm.	Thor Corp., Chicago
Fuzes	National Vendors Inc., St. Louis
Metal Parts for Fuzes	Benrus Watch Co., Waterbury, Conn.
Electron Tubes	Raytheon Mfg. Co., Waltham, Mass.
	RCA Victor Div., Radio Corp. of America, New York
Speakers	University Loudspeakers Inc., White Plains, N. Y.
Parts for Remote Controllers	Vickers Inc., Detroit
Parts for Diesel Engines	Murphy Diesel Co., Milwaukee

grants more freedom to producers to ship unrated orders to the 40 per cent civilian customers group. Concurrently, NPA revoked its Order M-41A which set up the standards of eligibility for priority ratings to obtain machine tools and related production equipment. The revocation does not change the procedures for obtaining ratings. Both actions were effective Nov. 17.

RAILROAD EQUIPMENT — Amendment of Nov. 7, 1952, of NPA Order M-73 permits railroads to acquire and use foreign and or scrap steel without charging it to their allotment; it eliminates the prohibition against use of the DO-U3 rating for procurement of construction machinery and it permits railroads to accept rails and track accessories on a seasonal basis, but it maintains inventory limitations by restricting the railroads to the allotments or advance allotments authorized under M-73. Amendment was effective Nov. 7.

Controlled Materials Plan

CONSTRUCTION — Amendment of Nov. 14, 1952, of Direction 6 to CMP Regulation 6 states that fourth-quarter nonmilitary authorized controlled material orders for construction steel placed between Nov. 17 and Nov. 28, 1952, and calling for delivery in February, 1953, will be scheduled for delivery in advance of those bearing first quarter, 1953, identification symbols and calling for delivery in the same month. It was effective Nov. 14.

BASIC RULES — Revision of CMP Regulation 1, issued and effective Nov. 18, 1952, combines in one document all the amendments and directions to this regulation. No major changes are made.

STAINLESS STEEL—Direction 9 to CMP Regulation 1 was revoked Nov. 18, 1952, effective on that date. It had removed non-nickel bearing stainless steel from the list of controlled materials. Its provisions are now part of a foot note to Schedule 1 of CMP Regulation 1.

Price Regulations

COKE—Amendment 12 of Supplementary Regulation 13 of General Ceiling Price Regulation, issued and effective Nov. 13, 1952, provides for an extension of 15 days in the adjustable pricing period granted by Amendment 11 for the by-product coke oven industry. NPA completed an industry survey and determined that the industry is entitled to relief under the industry earnings standard. The extra 15 days will give NPA the time to formulate the necessary amendment of SR 13 to grant the relief.

TRANSPORTATION RATES—Amendment 1 of Supplementary Regulation 35 of CPR 22, issued and effective Nov. 13, 1952, is a correction of the coverage of SR 35. Originally ceiling prices established under SR 30 of CPR 22 were excluded from applicability of SR 35. This amendment deletes from SR 35 the exclusion of those ceiling prices.

COAL—Amendment 2 of CPR 3, issued Nov. 14, 1952, authorizes bituminous coal mine operators to increase their ceiling prices an average of $0.33-0.35 a ton, the actual increase varying from mine to mine. Effective date is Oct. 1, 1952, except sales to retail dealers, which will be effective Nov. 14.

New OPS Branch Chief

David C. Holub, on leave of absence from D. C. Holub Co., Akron and Youngstown, O., iron and steel scrap firm, is the new chief, Iron & Steel Branch, OPS. He succeeds William Kerber who resumes his duties as vice president, Hanna Furnace Co., Detroit. Mr. Holub was chief of OPS Iron & Steel Scrap Section since August, 1951

FORGINGS—CPR 179, issued Nov. 14, 1952, and effective Nov. 19, establishes ceiling prices for all ferrous and nonferrous metal forgings on the basis of published price lists in effect on Jan. 25, 1951, adjusted to reflect changes in metal costs to July 30, 1951, and labor costs in effect on Mar. 15, 1951. Also, producers whose total net sales in 1951 did not exceed $100,000 are exempted from price control. Forgings were previously controlled by CPR 30.

EXPORTERS—Amendment 3 of CPR 61, issued Nov. 17, 1952, and effective Nov. 22, requires exporters to file reports required by Section 5 of the regulation with the district NPA offices by registered letter. Reports were formerly sent to the national office.

PRIMARY COPPER — Supplementary Regulation 125 of General Ceiling Price Regulation, issued Nov. 18, 1952, and effective Nov. 24, grants to manufacturers using primary copper a price increase similar to that given to manufacturers of brass mill and wire mill products under Amendment 1 of CPR 68 and Amendment 1 of CPR 110. It applies only to manufacturers operating under GCPR.

EXPORTS—Amendment 4 of CPR 61, issued Nov. 18, 1952, and effective Nov. 22, makes clear that where domestic sales of a commodity are exempted or suspended from price controls the exemption or suspension also applies to export sales and sales for export.

Industrial Diamonds In Rough

Industrial diamond consumption will reach 9 million carats this year, should climb to 9.5 million next year due to the increasing use of carbide tools. But only 7.6 million carats will be imported each year, leaving a deficit of over 3 million carats over the period.

That's the reason NPA's Industrial Diamond Salvage Division is holding meetings in various cities throughout the country in an effort to make industry more salvage conscious. Although salvage is expected to reach 800,000 carats this year, greater salvage effort and substitution of other types of grinding wheels and grinding methods must be instituted if a shortage more acute than that at present is not to develop.

More Expansion Goals Set

New expansion goals for pouring and silica refractories, ladle bricks and fire clay, super duty and high alumina bricks are announced by DPA. Certificates of necessity for rapid tax amortization have already been received.

An interim revision of the expansion goal for molybdenum ore and concentrates has been set at 70 million pounds of U. S. production in 1954. DPA set its original expansion goal on Jan. 4, this year, at 58 million pounds.

Pouring refractories expansion has been set at a capacity of 76 million nine-inch equivalents by Jan. 1, 1954. The standard size of refractories, 9 inches x $4\frac{1}{2}$ inches x $2\frac{1}{2}$ inches, is commonly referred to as a nine-inch equivalent.

The silica refractories goal is set at 431 million, ladle brick at 269 million nine-inch equivalents, and fire clay, super duty and high alumina brick at 782 million, each as of Jan. 1, 1954. As of Jan. 1, 1950, the capacity for pouring refractories was 53 million, for silica refractories 312 million and for ladle brick 205 million. The Jan. 1, 1950, capacity for fire clay, super duty and high alumina brick was 643 million.

Previously, expansion goals had been set for basic refractories at 140 million nine-inch equivalents, and insulating fire brick capacity at 56 million, both by Jan. 1, 1954.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

NEW SENATE COMMITTEE CHAIRMEN

Republican senators in line for committee chairmanships after majority reorganization of the Senate are:

AGRICULTURE—
George D. Aiken (Vt.)

APPROPRIATIONS—
Styles Bridges (N. H.)

ARMED SERVICES—
Leverett Saltonstall (Mass.)

BANKING AND CURRENCY—
Homer E. Capehart (Ind.)

EXPENDITURES IN EXEC. DEPTS.—
Joseph McCarthy (Wis.)

FINANCE—
Eugene D. Millikin (Col.)

FOREIGN AFFAIRS—
Alexander Wiley (Wis.)

INTERIOR AND INSULAR AFFAIRS—
Hugh Butler (Nebr.)

INTERSTATE COMMERCE—
Charles W. Tobey (N. H.)

JUDICIARY—
William Langer (N. Dak.)

LABOR AND PUBLIC WELFARE—
Robert A. Taft (O.)

POSTOFFICE AND CIVIL SERVICE—
Frank Carlson (Kans.)

PUBLIC WORKS—
Edward Martin (Penn.)

RULES—
William E. Jenner (Ind.)

Defense Department turns back to steel for needed "wonder metal" . . . Excess inventory now entirely excluded from renegotiation . . . Pay for inventions used abroad

AFTER CONCENTRATING on aluminum, magnesium and titanium to find the best materials for reducing the weight of airborne components and equipment, the Defense Department has pulled in its belt for a new study of the old standby steel.

It is seeking low-alloy, high-strength steels with tensile strength as close to 300,000 pounds per square inch as possible. It hopes to develop such steels through heat treatment and of modified compositions for designing lightweight airframe members and such items as bulldozers and other machinery which has to be flown to many forward locations.

This new research program has been assigned to Navy's Bureau of Aeronautics which already has placed two contracts, with National Bureau of Standards and the Naval Air Materials Center at Philadelphia, and is negotiating a third contract with a leading university. This new approach, say department spokesmen, will not in any way reduce the numerous research programs aimed at making fuller use of aluminum, magnesium, titanium and possibly other materials in lightweight construction.

Renegotiation Change . . .

An increase in value of a defense contractor's "excess inventory" of raw or semi-processed materials exempt from renegotiation under the 1951 act will be excluded entirely from his renegotiable sales rather than just allowed as a credit against his refund of excessive profit.

The change was made by the Renegotiation Board to comply more exactly to the law's requirement that any profit attributable to this increment "shall be excluded from consideration." Excess inventory is defined by the act as being "the inventory of products which is in excess of the quantity reasonably necessary to fulfill existing contracts or orders" and applies to agricultural commodities and products of a mine, oil or gas well, or other mineral or natural deposit, or timber, when in a raw or semi-processed state.

A contractor who claims that a portion of his profits attributable to the increment in value of excess inventory should be excluded from consideration in determing whether or not he has received excessive profits is required to give notice to the board of such claim at the time of or before filing RB Form 1B.

NATO Dough for Inventors . . .

After long negotiation, arrangements now are falling in line to compensate American firms and inventors for the use of their patents and know-how in the production of armaments in the NATO countries. Agreements have been negotiated with the United Kingdom, and that with Italy already has been signed and placed in operation; signing with United Kingdom now is only a formality.

In both cases Technical Property Committees are charged with overseeing license and other contract arrangements which the Americans make with manufacturers in those countries and with helping to arrange details of compensation and assure actual payment of compensation.

Agreements similar to those are being negotiated with the other NATO governments.

BAKER TRUCKS *at work*

Westinghouse saves in excess of $57,000 per year by FORK TRUCK HANDLING

- A fleet of fork trucks including Bakers, coupled with intelligent planning and material handling engineering, enables Westinghouse Electric Corporation to cut handling costs more than $57,000.00 per year at its huge East Pittsburgh works. Savings in which the Baker Trucks participate, include:

- **$12,000.00 warehousing raw materials in the molded materials section**
- **Another $12,000.00 handling finished molded products**
- **$9,000.00 on one scrap handling operation**
- **$7,500 by handling castings on pallets in yard storage**
- **100% added storage capacity in molded materials warehouse**
- **Doubling capacity of drum storage space in yard**

These savings were made possible by replacing manual handling and other slow methods with efficient fork-truck unit-load handling. In some instances Westinghouse devised special pallets and containers to achieve greatest speed and efficiency from their versatile Fork Trucks.

The Complete Story is documented in Baker Case Study Report No. 272. Use this coupon to get your free copy.

Illustrated above is a special stringer pallet which enables Baker Fork Trucks to tier and transport drums four at a time, doubling storage capacity and speeding these operations substantially by eliminating manual methods.

This method of handling scrap saved $9,000.00 in one year. Driver merely operates controls—the truck does the work.

Handling castings in yard storage on pallets with Fork Trucks saves $7500.00 per year over former methods—and multiplies storage capacity by tiering.

By palletizing bagged materials for fork truck handling, tiering to warehouse ceiling more than doubles storage capacity. This method cuts handling costs $12,000.00 per year.

THE BAKER-RAULANG COMPANY
1259 West 80th Street, Cleveland 2, Ohio

☐ Please send Westinghouse Case Study Report No. 272.
☐ I am also interested in ..... pound capacity trucks.

Name ..... *Title* .....
Company .....
Address .....
City ..... *State* .....

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the head with
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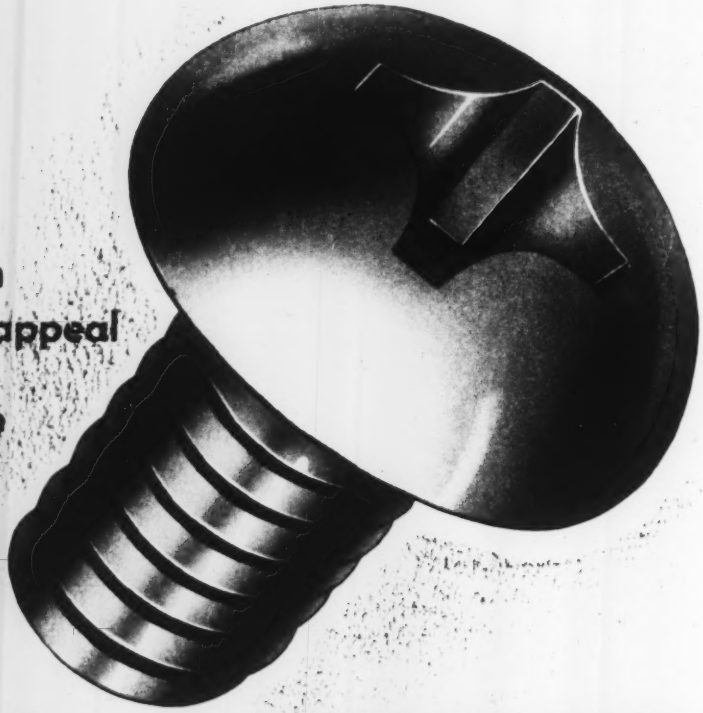
and
extra production
efficiency



Lamson & Sessions PHILLIPS HEAD

MACHINE AND TAPPING SCREWS

Lamson Phillips Head Screws win hands down when it comes to good looks *plus* production efficiency.

If you are still using common slotted head screws for external assemblies better take a good look at the possibility of switching to Phillips Head. The savings, in terms of faster, more efficient assembly and better looks, can more than compensate for their slightly higher price.

Right now Lamson & Sessions can offer you quick delivery on Phillips Head Machine and Tapping screws in most popular sizes. May we quote on your requirements?

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Check the products below that interest you; tear off bottom of ad and send to us for complete information.

MACHINE SCREWS
Precision made for fast economical assembly.

SEMS
Pre-assembled lockwashers on tapping and machine screws.

TAPPING SCREWS
Choice of round, pan, truss, flat oval, hexagon and phillips heads.

CAP SCREWS
"1035" Hi-Tensile Heat-treated steel.

SQUARE AND HEX MACHINE SCREW NUTS
Semi-finished, hot pressed, cold punched.

LOCK NUTS
Economical, vibration proof. Can be used repeatedly.

COTTER PINS
Steel, brass, aluminum and stainless steel.

"1035" SET SCREWS
Cup point type, hardened and heat-treated.

STEELMAKING

in Latin America

LATIN American steelmaking—where it has been, where it's going and the problems it will encounter—was discussed by the United Nations Economic Commission for Latin America at its meeting in Bogota, Colombia, Oct. 13 to 31. This technical assistance meeting is the first of several projected UN Expert Working Group meetings designed to assist in the economic development of world markets.

Through technical papers, German, French, Norwegian, Swedish, Belgian, Swiss, Italian, American and Canadian experts shared their experience with Latin American steelmen. Those technical papers, some containing hitherto undisclosed material, have not been cleared for publication or review.

Potential—Table 1 on p. 80 points up several significant facts in relation to the production potential of our neighbors to the south. The seven nations shown—the only ones with population of 5 million or more—account for 87 per cent of the land mass and 81 per cent of the population of Latin America. Annual income is low, as are wages. The notable exception to the latter is Venezuela, where the petroleum workers bring the average up.

The table also indicates that steel consumption is ahead of production by about 176,000 tons a year. On a per capita basis, the difference is

TABLE 1

COUNTRY	POPULATION thousands	INCOME per capita, 1948 dollars	WAGES[1] per hour, 1948 dollars	STEEL INGOT CAPACITY thousand of tons a year	pounds per capita	STEEL CONSUMPTION[2] thousands, of tons	lbs. per capita
Argentina	17,100	365	0.57	n.a.	—	1,200	154.3
Brazil	52,600	120	0.53	1,000[3]	38	870	37.5
Chile	5,800	200	0.44	275	94	206	77.2
Colombia	11,300	140	0.94	200	35	160	33.1
Mexico	25,100	130	0.49	550	43	600	52.9
Peru	8,330	105	0.41	75[3]	18	60	15.4
Venezuela	5,000	340	2.00	20	8	400	176.4
TOTAL	130,530			2,120	39.3	2,296[4]	65.4[4]

[1] Average wages paid in the petroleum or steel industries in the respective countries.
[2] At completion of present construction programs.
[3] Figures corresponding to finished steel, including wire, tubes and other simple steel products. Steel contained in imported machinery and equipment has been omitted.
[4] Argentina not included.

even more striking. This indicates, of course, that there is a great potential for steelmaking south of the border. As this potential is realized, the economic position of the people certainly will improve.

Raw Materials—How are those countries fixed for raw materials? How about their present and planned facilities? Those and many other questions had to be answered by the experts as a prelude to their technical considerations. The map on page 79 and the tables on pages 81 and 82 give clues to the answers.

Ore Reserves Good

It is estimated that those seven countries have a minimum of 16.5 billion tons of iron ore reserves varying in quality from about 40 per cent iron content to 68 per cent. Most of it is of low phosphorous content. If probable reserves materialize, the iron ore situation will be excellent.

Brazil Tops—Brazil has the largest deposits of iron ore, which in part accounts for its greater development of the steel industry than its neighbors. Its ores are top quality and have been exported in large quantities. Argentina, though low in reserves, has not let that stop the planning for greater production. Peron's nation augments its meager supplies with charcoal pig iron produced at Zapla and with large imports of steel billets—over 180,000 tons in 1951. Transportation from the inland fields to the areas of consumption still remains Argentina's main problem.

Chile has three main fields, but only one, El Tofo, is being worked. It is almost exhausted now, but the El Romeral field is expected to take its place next year. Most of the ore is exported to the U. S. Colombia and Peru are probably the most ore-hungry nations in the group, but as industrialization progresses, probable deposits may develop and better their positions.

Geographically Speaking — From the point of diversification, Mexico is the best off in iron ore. Five different deposits are located close to steelmaking facilities or transportation lines.

The ores of Venezuela are probably the most familiar to U. S. users. Since 1951, Bethlehem Steel Co. has been importing Venezuelan ores, and U. S. Steel expects to begin similar operations from Cerro Bolivar by 1954. There are large known reserves in addition to those.

Coal Is Questionable

If the Ancient Mariner had been a modern Latin American steelmaker, his cry of anguish might well have been, "Coal, coal everywhere, but not a ton for coke!" Total known reserves are set at over 19 billion tons for the seven nations, with several billion tons more listed as probable. But it is either too far from consumption centers or the quality is not right for coking.

Some Are Lucky — Brazil has about half a billion tons of coal available, but only one steelmaking plant — at Volta Redonda — uses metallurgical coke. Some of the coals mined in Colombia are suitable for coking, but most of that nation's 12-billion-ton coal reserve is of highly variable quality.

Mexico is in a favorable position again with over 2 billion tons in reserve. The most important area is Cuenca de Sabinas, which up to now has produced all the coking coal. Peru has about 4 billion tons of good bituminous of coking quality.

In Venezuela, exploration for coal has taken a back seat to oil, but indications are that several hundred thousand tons are in the ground. Preliminary tests show that these coals will need mixtures of higher-grade imported coal to be suitable for coking.

Production on Rise

Only Brazil, Chile and Mexico at present have integrated steel industries. Colombia and Peru are building integrated mills, and Argentina is expanding its rolling mills. Ven-

TABLE 2

COUNTRY	IRON ORE RESERVES[1] thousands of tons	IRON CONTENT per cent	COAL RESERVES thousands of tons
Argentina	180,000	40-55	250,000[2]
Brazil	15,000,000	55-68	500,000
Chile	300,000	50-63	300,000
Colombia	100,000	48	12,000,000
Mexico	230,000	60-61	2,175,000[3]
Peru	140,000	58	4,000,000
Venezuela	602,000[4]	40-65	n.a.
TOTAL	16,552,000		19,225,000

[1] In some cases, figures represent the best possible estimate.
[2] Probable reserves of 350 million tons.
[3] Probable reserves of about 2.2 billion tons.
[4] Possible reserves of about 1.7 billion tons.

ezuela has plans for expanding its rolling capacity.

Of the three more-developed nations, Brazil outproduces the other two combined. Production of finished steel products is now about 700,000 tons a year. Plans are in the works to more than double that in the next three years.

Below Capacity — At present, Chile's two furnaces put out 146,000 tons of pig iron annually. But two rolling mills at Santiago with a capacity of 40,000 tons are producing only 32,000 tons a year.

Mexico has had its own steel industry for some time, the first plant having started in Nuevo Leon in 1903. Its annual capacity is 290,000 tons of pig iron, and a finishing plant there can turn out 180,000 tons a year. Transportation offers a problem, but an increase in production nevertheless is underway. Other plants are spread throughout the nation, but one worth mentioning is Hojalata y Lamina S.S. in Monterey. It has a tunnel kiln for sponge iron capacity of 12,000 tons a year. This is possibly the first sponge iron plant in Latin America, and its success may bring more.

New Plant for Colombia—Under consideration is a 120,000-ton-capacity plant at Paz de Rio in Colombia. It will produce mainly bars, wire and wire products, light sections and rails. Later new facilities will add plate, sheet and tin plate to integrated production.

Peru, which would seem to be ideal for steelmaking from a materials viewpoint, is building its first plant. It will have a capacity of 38,000 tons of bars, light sections and wire and 15,000 tons of sheet. While Venezuela has only one plant producing about 10,000 tons a year, the possibility of an integrated mill is being studied. If it materializes, that nation may join the ranks of Latin American steel producers.

What About Future?

Tables 1 and 2 taken together give a possible clue to the future of steelmaking in Latin America. On the one hand, it is evident that there is room for expansion in the industry—there is a market. On the other hand, it is equally evident that the basic materials—iron ore and coal—are present in considerable quantity.

The problem of low-quality coal can be solved partially by importing higher grades to be mixed with the domestic product for coking. Another partial solution is found in charcoal. The transportation problem also is being licked by new railroads. And with the aid of organizations similar to the UN Expert Working Group, Latin America can take a bigger role in the steelmaking future.

Aluminum Die Castings Up

Automatic transmissions figure in shift for predominantly civilian die casters

DIE CASTERS' sales volume is holding its own at the $225 million level this year, but it's marked by a shift to more aluminum castings and less zinc.

This year zinc consumption is 206,000 tons compared with 226,000 tons last year, while aluminum has jumped from 128 million pounds last year to 172 million pounds this year. Zinc is still the overwhelming favorite, accounting for about 65 per cent of all metal used by die casters, but aluminum is moving up.

Automatic Shift—Several factors account for the shift, one the increased use of heavy aluminum castings in automatic transmissions for automobiles. Others include: Reduced auto output because of the steel strike, a lack of nickel as a base for chrome plating and a more rational price basis for aluminum, says American Die Casting Institute.

The old zinc-aluminum consumption ratio among die casters is expected to move closer to former proportions as zinc prices fall and the auto industry steps up production. Auto makers use about 50 per cent of zinc die castings produced by jobbing shops and about 25 per cent of their aluminum output. The auto builders' share of the total die casting shops' production—both captive and jobbing—is even greater than the 50-25 per cent take of zinc and aluminum from jobbers only.

Not G. I. — The heavy civilian output relegates the defense uses of die castings to a modest five to ten per cent of output. Die castings are used in aircraft instrument panels where some expansion may be expected, but the bulk of defense volume is expendable items already at peak production.

So die casters are looking to the civilian consumer of applicances and autos as their forte in 1953. They have all the zinc and aluminum they need, and as steel is diverted to the civilian market, they expect die castings to be bolted solidly to the rising output.

When a high-strength steel is needed

for severe cold-formed shapes like these bumpers

Specify→ N-A-X HIGH-TENSILE STEEL

and get all of the requirements of SAE 950

When a material meeting the requirements of the high-strength, corrosion-resisting steels of SAE Specification 950 is used for severe cold-formed shapes, it will pay to investigate N-A-X HIGH-TENSILE steel—the low alloy steel with *built-in formability*. Its finer grain and higher hardness also result in brighter luster when ground and polished for plated parts.

GREAT LAKES STEEL CORPORATION
N-A-X Alloy Division
Ecorse, Detroit 29, Mich.

NATIONAL STEEL CORPORATION

A New Model Emerges

What's involved in the design and production of those shiny 1953 cars you're beginning to see on the streets? Here's a behind-the-scenes report on how the new Dodge was born

A TOP MAN in Chrysler Corp.'s Engineering Division recalled that as a youth working on the drafting board he had wished fervently that someone would write a book telling how to design an automobile engine. He thought there ought to be some methodical way in which, part by part, a new engine could be conceived and engineered. He's still waiting.

So it is with every component of a car; there's precedent, but there's no pat plan. Management is not able to say, "We'll have a new car", and all the members of the organization then put their instruction sheets in front of them and start doing step 1, step 2, etc. Instead, management makes this decision and a considerable portion of the organization launches into one-and-a-half or more years of organized chaos.

Styling: Only Skin Deep

The man-on-the-street concept of an automobile design change has it revolving around the styling section. When styling comes up with an acceptable-looking product, fingers are snapped and off assembly lines start rolling the new cars. The automakers have done little to dispel the notion. In fact they emphasize this phase of their activities because of its glamour and because they realize that looks help sell cars. Little known or appreciated are the staggering number of manhours which go into engineering and detailing of parts and preparing automakers' and suppliers' plants for production. This, however, is the part of the "Car is Born" story which is of dominant interest to metalworking and allied industries.

Chrysler Corp.'s Department of Technical Data & Information says 56 weeks is about the minimum time required from design to production of a single model when no changes are required after the basic design has been approved and when no tooling difficulties come up.

This schedule begins with management approval of proposed body lines based on several of the most promising $\frac{3}{8}$-scale clay models. This selection requires about two weeks. The side view of the accepted clay model is transferred, full size, to a blackboard, a procedure taking another two weeks. Next step is to construct a full-size clay model, six weeks going by in the process. This model is sectioned with templates being taken off to permit the surface contours to be duplicated. This step takes two more weeks. Now 12 weeks after the design is fully approved, layout and detailing of every part begins.

Six to eight months will be required for complete body detail design, but after three months sufficient information is available to enable die model activity to begin, and so about 14 weeks is optimistically figured for the initial drafting work. From it accurate replicas of the major sections can now be made in solid mahogany. (Plastic is also being used by some companies). Making these die models, designed to be nested or "stacked" into complete assemblies, takes about six weeks. While the drafting and die model making is in progress, a full-size model in wood with exterior and interior parts exactly as wanted in the finished car is being constructed. Bumpers are hung on this car; dummy wheels and ornamentation are added as is interior trim.

At the same time, "program" cars in metal, are being built by hand from the detail drawings. Four months are needed, barring any slip-up, to get these prototype cars constructed. Thirty-two weeks have now passed. The biggest job

is still ahead designing and shaping the dies and the other tools needed to fabricate and assemble the production automobile's components. This phase of the program is allowed a minimum of 24 weeks.

This ideal situation overlooks most of the details and problems. It ignores the prior styling and engineering work, the continuous consultation of experts and decision-makers, in the company, and the vendors' role. To fill in all these gaps you need a hefty book. But some of the little known high points can be capsulized for an insight to the job.

The experience of Chrysler is noteworthy because its 1953 models are completely different, and because the new car program was carried on under some of the most trying circumstances possible to imagine. In the Chrysler organization, the Engineering Division is responsible for all models' product styling and basic engineering. But only the activities which affected Dodge are considered below for the sake of simplicity.

Timetable for Dodge

There is no way to pin down a date on which work first began on the new Dodge; ideas were picked up from stylists' futuristic sketches made as long ago as a decade or more. The same is true of the new V-8 engine, incorporating the hemispherical combustion chamber. Some of the basic exploration into this type of engine was going on in the corporation more than a dozen years ago. And the engine, like nearly all the major engineering developments, was not given a model-year goal.

The 1953 Dodge model, as such, can be traced back to a few weeks after the end of Chrysler's 104-day long strike in May, 1950. At that time the ⅜-scale clay model was being approved and the full-size blackboard drawing of the car was getting the nod as providing the over-all room and style which was desired. The chassis men had previously explained what would be necessary in the way of wheelbase and engine compartment room.

A full-size clay model had been sculptured by about the end of that year so that the car could be judged from all angles and the proportions could be satisfactorily known; this could not be done with certainty in the small model or the blackboard rendering. The clay model had the advantage that its surface lines and details could be doctored until everyone was completely satisfied with them, and when this agreement was obtained work began simultaneously on the three next steps: Construction of a full-size wood model, completely trimmed, equipped with hinged doors and all other details; a seating "buck" using the true interior dimensions was also built so that exterior and interior work could be done without interferences; templates were made from the clay model so that the lines could be taken off the three-dimensional form and put on the flat plane of what the industry calls the "body draft."

This 20 x 5 foot sheet of aluminum would contain the plan and elevation views of the car, so jumbled together that no one except an expert could make head or tail of them. Four men working on portions of this draft at the same time develop the surface lines first. From these, die model makers can get started on their mahogany patterns. The body structure is filled in next on the draft and the floor plan is completely developed so that chassis engineers can go to work on their layouts.

Auto, Truck Output

U. S. and Canada

	1952	1951
January	409,406	645,688
February	467,691	658,918
March	517,207	792,550
April	576,505	680,281
May	546,673	695,898
June	560,947	653,682
July	246,461	522,858
August	293,722	571,442
September	593,060	505,758
October	654,357*	558,971
November		480,199
December		402,729
Total		7,179,161

Week Ended	1952	1951
Oct. 18	138,088	120,810
Oct. 25	144,747	121,215
Nov. 1	155,037	118,743
Nov. 8	143,610	117,342
Nov. 15	147,513	120,767
Nov. 22	145,000*	80,489

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

Matter of Tooling

The mahogany die models are regarded as the "bible" for the car's contours as soon as they have been made. When these were stacked together with each unit representing a sheet metal surface panel they underwent scrutiny by the division's master mechanic, operating manager and general manager who ascertained very closely what tooling would be needed for the future assembly job. Even earlier than this session, this group had inventoried the tools and fixtures then in use and had arrived at an approximation of the new and redesigned ones to be required. Estimated costs of the program must be obtained as early as possible.

Since Chrysler policy for most of the large stamping dies is to procure them outside, the die models then were sent out to the specialized die shops which engineer the dies, have the responsibility of ordering the die blocks from foundries, and finally follow up by shaping and in many cases "spotting" the dies, a cut-and-try process to obtain exact mating of the male and female dies. Most of the largest dies needed for the new body were ordered in the spring of 1951.

Assembly fixtures simultaneously were being designed and built for Dodge's two assembly plants. A deciding factor on the amount of tooling which would be permissible was the production volume which had previously been estimated. The master mechanic's department which is responsible for all tooling necessary to build the product tries to lay out these tools so that many subassemblies can be completed before reaching the final assembly line. In preparation for the 1953 model, welding fixtures and equipment were ordered at midyear, 1951.

In all assembly tooling the final date at which equipment had to be back in the plant was about two months prior to large-scale production, for an adequate tryout. The steel strike this summer

(*Please turn to p.* 115)

THE NEW BRITAIN MACHINE COMPANY

What names come to your mind when you think of progressive manufacturing?

MOST of the ones you think of first have bought New Britain Automatics within the past few years for new and better ways of doing important metalworking jobs. The New Britain-Gridley Machine Division, The New Britain Machine Company, New Britain, Conn.

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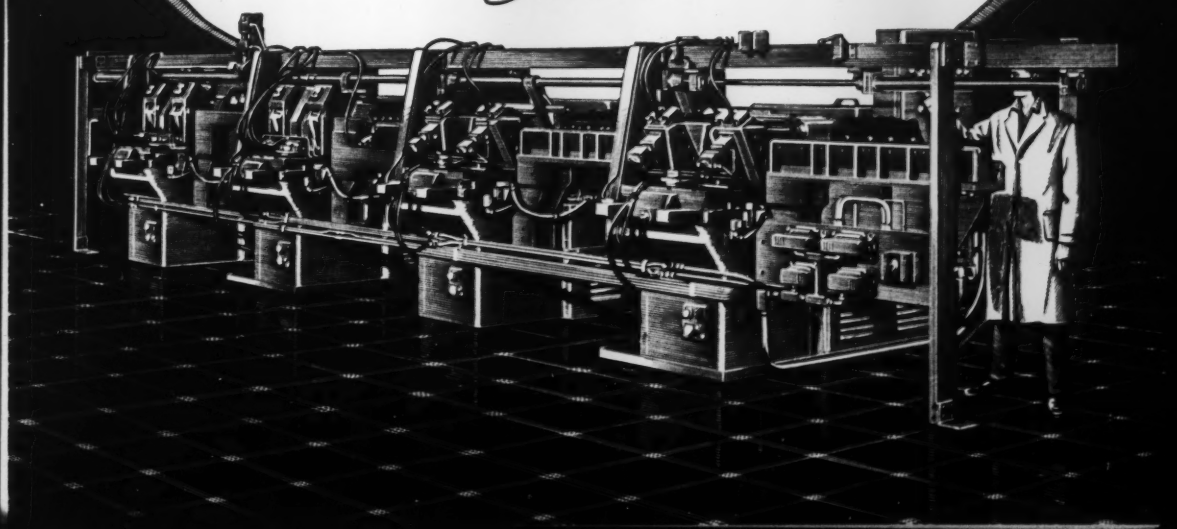
LUCAS HORIZONTAL BORING, DRILLING AND MILLING MACHINES

NEW BRITAIN
Automatics

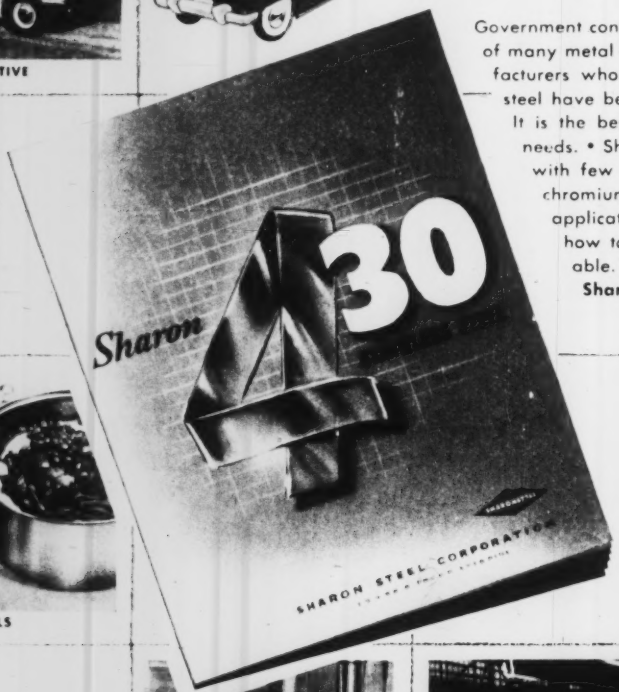


Now—

facts about 430 Stainless Steel for manufacturers concerned about critical materials

AUTOMOTIVE

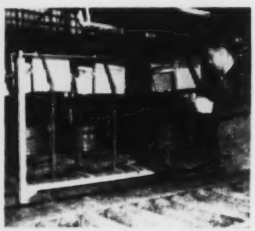
Government controls are pinching the raw material supplies of many metal fabricators. However, many of these manufacturers who are familiar with Sharon "430" stainless steel have been able to quickly adapt it to their needs. It is the best available material for many of today's needs. • Sharon "430" is in good supply and available with few restrictions as to end use. It is a straight chromium stainless steel with hundreds of successful applications. A new booklet with instructions on how to fabricate Sharon "430" stainless is available. Get your copy by writing department 81152 **Sharon Steel Corporation, Sharon, Pa.**



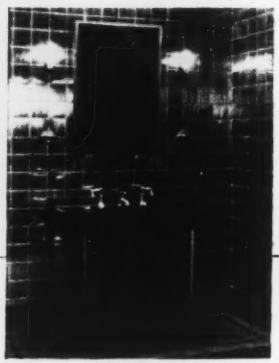
UTENSILS

SPECIAL

AGRICULTURAL



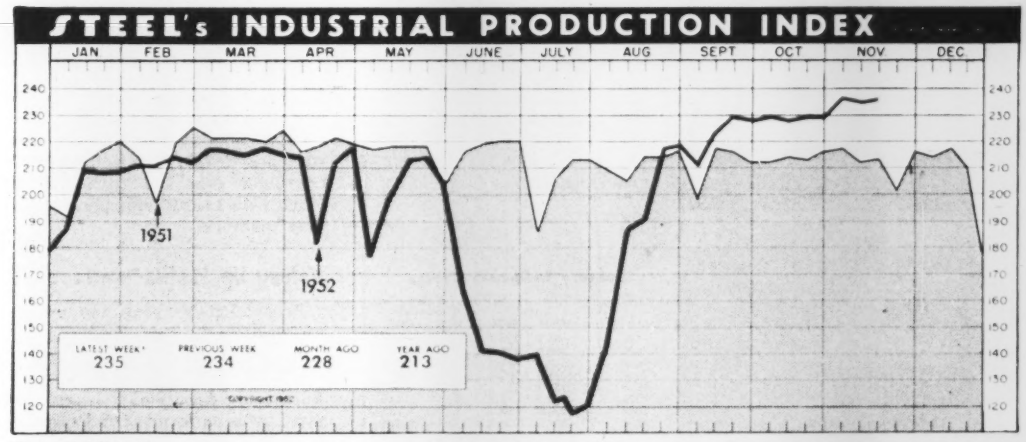
APPLIANCES



ARCHITECTURAL

Sharon 430 stainless steel

SHARONSTEEL



*Week ended Nov. 15

Based upon and weighted as follows: Steelworks Operations 35%, Electric Power Output 23%, Freight Car Loadings 22%, and Automotive Assemblies (Ward's Reports) 20%.

Production may follow a seasonal pattern well above last year during the coming weeks. Industrial activity index inches up as automotive and electricity production jump

A PATTERN of brisk industrial activity is in prospect for the rest of 1952. Production is expected to hold at present high levels, except for two drops—at Thanksgiving and the last half of December.

Manufacturers are running their equipment at record momentum now. STEEL's industrial production index for the week ended Nov. 15 soared 22 points over the like 1951 week at 235 per cent of the 1936-1939 average. This 22-point lead probably will be maintained the rest of this year.

Here's Why — Prime indicators of the nation's industrial output may rise or dip somewhat in the coming weeks. But, aside from holiday cutbacks, these variations are expected to cancel each other.

Here's what some key industries are scheduling:

Steel companies will keep pouring a heavy weekly tonnage. The industry reached a new output peak in October, and steel production since has dipped only slightly. Steel companies, however, may set new production records next month when new facilities come into use.

Electric power production will rise as cold weather arrives. Generation probably will move upward about 6 per cent over last year's output, despite hydroelectric power shortages resulting from the drought in the Northwest. Reports from Washington and Oregon indicate, however, that this area's electricity supply isn't as drought-stricken as was first believed.

Crimped — Automotive production is on the downgrade. Detroit will curtail many passenger car assemblies, as more companies switch to new models. Steel shortages and the present rash of suppliers' strikes also are expected to crimp automotive production during the rest of the year.

Freight car loadings are slated to take a seasonal drop in early December. By then, most holiday goods will be in retail stockrooms or on store counters. Yet industrial and mineral loadings will keep the nation's railroads fairly busy until Christmas.

Steel Production Heavy . . .

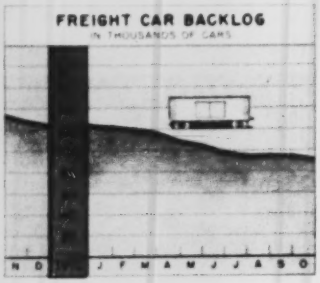
Heavy demand for steel keeps steelmakers' furnaces in full production. The American Iron & Steel Institute estimates that U. S. companies in the week ended Nov. 22 poured 2,203,000 net tons of steel for ingots and castings. This is 12,000 tons under steel production a week earlier.

GNP Inches Up . . .

Despite the steel strike, our production wealth continued rising in the third quarter, says the President's Council of Economic Advisors. The nation's gross national product (total valuation of the nation's goods and services) rose to an annual rate of $344 billion. That's $800 million over the GNP in the second quarter. Personal consumption expenditures rose $1.1 billion, while private investment rose $1.1 billion. Government expenditures—partly as a result of the steel strike—remained at an annual rate of $78 billion.

Auto Industry Divided . . .

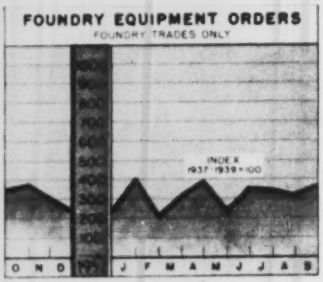
Passenger car makers are divided into two camps, those approaching model change-overs and those completing them. Not until after the first of the year will the industry get on full schedule. And this depends on whether carmakers get enough steel. At present the steel picture is darkening. Some companies now producing '53 models are halting overtime operations. A few weeks ago, these companies were trying practically anything to



Freight Car Awards and Backlogs

	Awards		Backlogs*	
	1952	1951	1952	1951
Jan	5.135	26.356	120.251	144.758
Feb	7.358	15.947	118.900	134.861
Mar	5.619	11.271	115.854	158.619
Apr	397	6.628	108.270	155.871
May	2.502	4.919	103.910	150.628
June	3.264	6.783	99.615	147.725
July	1.536	2.417	95.262	144.810
Aug	4.558	1.928	95.761	139.014
Sept	3.628	9.657	95.377	140.135
Oct	1.423	3.464	90.708	132.792
Nov		6.752		129.158
Dec		3.309		123.947
Total		96.190		

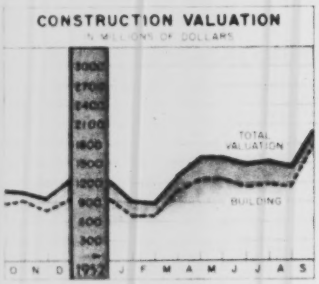
* End of month
American Railway Car Institute



Foundry Equipment Orders

	Index		Value Thousands	
	1952	1951	1952	1951
Jan	404.5	668.0	$1.862	$3.075
Feb	200.4	638.6	922	2.940
Mar	310.0	599.0	1.427	2.758
Apr	385.1	490.1	1.773	2.256
May	225.2	431.7	1.037	1.987
June	353.8	393.2	1.629	1.810
July	343.9	390.3	1.583	1.797
Aug	311.6	404.5	1.434	1.862
Sept	365.9	346.5	1.685	1.595
Oct		372.4		1.714
Nov		305.5		1.406
Dec		230.5		1.061

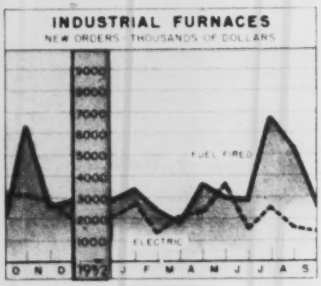
Foundry Equipment Mfrs. Assn.



Construction Valuation
(37 States—In Millions of Dollars)

	Total		Building	
	1952	1951	1952	1951
Jan	902.2	1.043.2	695.4	881.9
Feb	885.2	1.140.5	697.8	962.3
Mar	1.321.2	1.267.4	1.036.0	1.043.8
Apr	1.597.5	1.375.0	1.243.9	1.108.9
May	1.961.6	1.551.9	1.216.2	1.295.0
June	1.488.8	1.408.9	1.133.3	1.098.4
July	1.511.3	1.379.8	1.170.8	1.084.7
Aug	1.438.7	1.262.8	1.147.5	1.043.5
Sept	2.039.2	1.092.9	1.760.8	884.2
Oct		1.051.4		914.4
Nov		931.8		771.6
Dec		1.234.3		939.4
Total		15.751.6		13.027.9

F. W. Dodge Corp.



Industrial Furnaces
New Orders—Thousands of Dollars

	Fuel Fired*		Electric	
	1952	1951	1952	1951
Jan	3.379	4.033	2.856	2.764
Feb	2.413	4.670	1.364	3.312
Mar	1.813	7.019	2.100	4.846
Apr	3.606	8.497	2.298	3.657
May	3.032	5.044	3.713	4.766
June	2.954	6.259	1.552	3.376
July	6.728	5.303	2.530	3.587
Aug	5.259	4.580	1.628	3.891
Sept	2.462	1.821	1.412	3.250
Oct		6.374		3.172
Nov		2.516		2.882
Dec		2.875		2.100

* Except for hot rolling steel
Industrial Furnace Mfrs. Assn.

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Issue Dates on other FACTS and FIGURES Published by STEEL

Durable Goods	Sept. 22	Machine Tools	Nov. 10	Refrigerators	Sept. 29
Employ. Metalwkg.	Oct. 27	Malleable Castings	Nov. 3	Steel Castings	Nov. 3
Employ. Steel	Oct. 27	Pumps	Oct. 13	Steel Forgings	Oct. 20
Fab. Struc. Steel	Oct. 27	Prices, Consumer	Oct. 20	Steel Shipments	Nov. 3
Gear Sales	Nov. 17	Prices, Wholesale	Oct. 20	Vacuum Cleaners	Nov. 10
Gray Iron Castings	Nov. 3	Radio, TV	Oct. 6	Wages, Metalwkg.	Nov. 17
Indus. Production	Nov. 17	Ranges, Elec.	Sept. 29	Washers	Oct. 13
Ironers	Nov. 10	Ranges, Gas	Oct. 13	Water Heaters	Oct. 13

speed cars to dealers' show rooms.

U. S. auto-truck operations in the week ended Nov. 15 inched up slightly, however. *Ward's Automotive Reports* says that 108,302 passenger cars and 30,376 trucks were driven off U. S. assembly lines that week, compared with 105,042 passenger cars and 29,212 trucks a week earlier.

U. S. and Canadian output in the week ended Nov. 15 rose to 147,513 passenger cars and trucks, compared with 143,610 units during the previous week.

Volume Up, Profits Down . . .

Production is rising and profits are declining. This divergence in volume-profit relationship is underscored in the October survey of Purchasing Agents of Chicago. Almost twice as many of the association's members reported higher production in October than a month earlier. Yet 23 per cent of the buyers said profits were worse, 57 per cent reported profits about the same and only 20 per cent said their companies netted better profits in October than in September.

Inventories reflected the higher business tempo by increasing in October. Yet P. A.'s were still cautious in filling stocks depleted by the steel strike. Likewise, there was some change from the shorter ordering periods to 60-90 days. Higher prices took hold in October as more companies were subjected to recent price advances for steel and other materials.

A continued shrinkage of the labor market was indicated in the survey as employment and payrolls increased. Fifty-five per cent of the buyers said their companies would hire more production workers if available.

Removal of credit restrictions had little effect on most companies; only 7 per cent of the purchasing agents said credit easing helped their firms.

More Buyers Born . . .

Makers of civilian goods have good news in recent population reports. Soaring population now means more customers for washers, stoves, and refrigerators in 1972. The U. S. Bureau of the Census reports that the nation's popula-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	106.0	106.0	101.0
Electric Power Distributed (million kwhr)	7,830[1]	7,807	7,333
Bituminous Coal Output (daily av.—1000 tons)	1,651	1,529	1,921
Petroleum Production (daily av.—1000 bbl)	6,600[1]	6,612	6,237
Construction Volume (ENR—millions)	$411.5	$195.4	$313.0
Automobile, Truck Output (Ward's—units)	147,513	143,610	120,767
TRADE			
Freight Car Loadings (unit—1000 cars)	840	829	814
Business Failures (Dun & Bradstreet, number)	148	143	109
Currency in Circulation (millions)[3]	$29,905	$29,748	$28,601
Dept. Store Sales (changes from year ago)[3]	−8%	−5%	+2%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$14,940	$15,737	$13,801
Federal Gross Debt (billions)	$264.9	$264.9	$257.9
Bond Volume, NYSE (millions)	$19.8	$13.3	$9.5
Stocks Sales, NYSE (thousands of shares)	5,893	6,632	5,122
Loans and Investments (billions)[4]	$77.0	$77.0	$72.3
United States Gov't. Obligations Held (billions)[4]	$32.3	$32.4	$31.6
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	181.31	181.31	171.92
STEEL's Nonferrous Metal Price Index[6]	215.4	214.0	234.9
All Commodities[7]	110.0	110.0	113.7
All Commodities Other Than Farm and Foods[7]	112.1	112.1	114.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1951, 1,999,035; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

tion increased at a rate of 4.2 per cent in the two years and 5 months between April, 1950 and September, 1951. This implies an annual growth of 1.7 per cent, compared with 1.4 per cent a year for the 1940-1950 decade.

Freight Cars Up . . .

As the steel supply improves, freight car builders are able to boost output. American Railway Car Institute says that deliveries of new domestic freight cars rose to 5437 units in October, compared with 3762 in the previous month. Car production in October fell considerably beneath the 10,082-unit output in October, 1951.

Despite low production, the industry's order backlog continued its 17-month decline. The institute reports 90,708 freight cars were on order Nov. 1, compared with 132,792 units on the same date in 1951. New orders placed in October dropped to 1423 freight cars, the lowest monthly award-volume since April.

More Promise for TV . . .

While TV sales will probably slow down now that the election is over, makers of video sets are continuing to boost output and add new production facilities. Prime reason for this is the opening of new sending stations. The Federal Communications Commission announces that it has approved ten more television stations for nine cities. The new grants bring to 99 the number of new commercial stations approved by FCC since it lifted its construction ban on new stations last April.

Aluminum Products Soar . . .

Air Force and other defense orders have given a considerable boost to aluminum goods production in the past year. Shipments of aluminum wrought products reached 166 million pounds in September, about 28 per cent over shipments in September, 1951.

Trends Fore and Aft . . .

Business failures in 1952 average 149 per week, compared with 160 in the same period in 1951 . . . Contract awards for heavy construction in the week ended Nov. 13 shot 32 per cent over the average week to date. Industrial and mass-housing awards provided the boost . . . Bank clearings in October rose to $14.9 billion, more than 8 per cent over clearings in October, 1951 . . . Shipments of steel forgings rose 49 per cent in strike-free August, but were 13 per cent under August, 1951.

Which kind of Cold Rolled Strip Steel is best for You ?

CONSIDER SHEET COIL

—if variations in physical characteristics are permissible.
—if fairly heavy oversize gauge variations are not objectionable.
—if the fabricating operations are not too complicated and do not require intricate expensive dies.
—if a fine surface finish is not essential.
—if a good base for paint or enamel is desired.
—if you do not object to some "square footage" loss due to oversize variation.
—then Sheet Coil will probably be the most economical material for the job.

CONSIDER THINSTEEL

—if you must have a high degree of uniformity of chemistry and physical properties—and precision gauge tolerances.
—if you wish to keep die wear low, no oversize gauge variations.
—if you require a fine finish or a better base for plating.
—if you want maximum yield for "most finished parts per ton."
—if you want selected tempers for maximum strength and lightest weight.
—then you'll find Thinsteel the most economical material by far.

You can always count on Kenilworth helping you get the right steel for your requirements. Order Sheet Coil or Thinsteel and notice that each coil carries an identifying tag as pictured above. Call on Kenilworth, too, for your needs in Stainless Sheets or flat rolled Spring Steels (Annealed or hardened and tempered).

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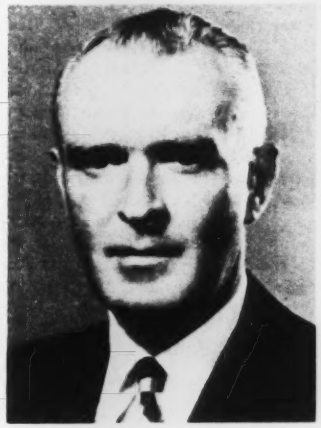


DANIEL T. WELLMAN
. . . new president for Wellman Bronze

R. F. LEDFORD
. . . joins Industrial Filter & Pump

Robert S. Sweeney was named vice president and general manager, Wason-Stillman Co., the hydraulic press division of **H. K. Porter Co. Inc.**, Roselle, N. J. He will be in charge of manufacturing and sales.

George P. Krumlauf was named metallurgical engineer for the pig iron and coal chemicals sales division of **Republic Steel Corp.**, Cleveland. He succeeds the late **T. G. Johnston.**

John S. Speer II was appointed sales manager, Speer Resistor Division and Jeffers Electronics Division, **Speer Carbon Co.**, St. Marys, Pa.

John G. Holschuh was named manager of the newly created market research section, **Elastic Stop Nut Corp. of America**, Union, N. J.

Duriron Co. Inc., Dayton, O., appointed **Richard Schermer** manager of pump sales and **R. A. Prosser** manager of building equipment sales. **Wendell A. Watkins** was promoted to Chicago district manager from Buffalo, where he is succeeded by **D. E. Christie** as manager-sales for that territory.

E. C. Freeman is now factory manager of **Chrysler Corp.'s** Trenton, Mich., plant.

Daniel T. Wellman was elected president, **Wellman Bronze & Aluminum Co.**, Cleveland. He succeeds **F. S. Wellman**, now chairman of the board. The changes will be effective Jan. 1. Mr. Wellman, the new president, is currently manager of Dow Chemical Co.'s Cleveland office.

Robert I. Roth was appointed vice president in charge of western sales for **White-Roth Machine Corp.** with headquarters in Dallas.

A. V. DeYot was transferred from manager of **National Radiator Co.'s** steel boiler fabricating plant in Middletown, Pa., to manager, plastic metals plant in Johnstown, Pa.

C. Harvey Pecor was appointed manufacturing engineer, hydraulic control division, **Blackhawk Mfg. Co.**, Milwaukee.

Francis J. Trecker, president, Kearney & Trecker Corp., Milwaukee, was elected treasurer of the **National Machine Tool Builders Association** at its annual meeting at White Sulphur Springs, W. Va.

Carroll C. Parker was appointed assistant manager of grinding wheel sales for **United States Rubber Co.'s** mechanical goods division with headquarters at the Ft. Wayne, Ind., plant.

R. F. Ledford was appointed director of sales and research, **Industrial Filter & Pump Mfg. Co.**, Chicago. He formerly was superintendent of finish, Sunbeam Corp. and prior to that was sales engineer, Hanson-Van Winkle-Munning Co.

S. K. Derderian was appointed assistant general manager, **Metal Hydrides Inc.**, Beverly, Mass.

Richard T. Funnell was appointed office manager and purchasing agent for **Strong Steel Foundry Co.**, Buffalo. He will buy all material and supplies except office supplies and equipment, hardware and steel warehouse material, purchase of which will be handled by **Donald L. Drennan.**

Nachman Corp., Chicago, elected **Fred A. Nachman Jr.** executive vice president and **Cecil S. Semple** vice president in charge of sales.

H. Stuart Harrison, vice president-treasurer, Cleveland-Cliffs Iron Co., was elected to the board of **Jones & Laughlin Steel Corp.**, Pittsburgh. He succeeds **E. B. Greene**, chairman of the board of Cleveland-Cliffs, who had served on J&L's board since 1942.

John P. Kenney was appointed Boston district sales manager of steel

FLOYD A. GARMAN
AS&W chief engineer

THOMAS E. LLOYD
sales mgr. at Salem-Brosius

G. JEWETT CRITES
F. J. Stokes dept. mgr.

building products sales for **Berger Mfg. Division**, Republic Steel Corp.

Floyd A. Garman was named chief engineer and **Walter V. Magee**, assistant chief engineer of **American Steel & Wire Division**, U. S. Steel Co., Cleveland. Mr. Garman succeeds **Harry L. Jenter**, promoted to assistant manager of operations, Cleveland district. At Chicago **James R. Mohr** was named manager, merchant products sales department, to succeed the late **Walter M. Floto. C. P. Greenlee** succeeds Mr. Mohr as assistant manager-sales, Detroit, where **W. M. Welsh** becomes assistant to manager of sales.

Frank Kuether was named executive engineer of **Le Roi Co.**, Milwaukee, responsible for operation of all departments of Le Roi's engineering division.

Thomas E. Lloyd, formerly assistant to the president, was named manager of sales of **Salem-Brosius Inc.**, Pittsburgh. Before joining Salem-Brosius in February, 1952, he had been manager of publications for American Institute of Mining & Metallurgical Engineers and editor of its publication, *Journal of Metals*.

Thomas E. Wood was elected a director and chairman of the board, **Aluminum Industries Inc.**, Cincinnati. Other directors elected were **Norbert A. McKenna, Henry A. Benjamin** and **Clement S. Crystal**.

Roy A. Kropp, president, Kropp Forge Co., was elected a director of **Cenco Corp.**, Chicago.

G. Jewett Crites was named manager of the vacuum furnace department of **F. J. Stokes Machine Co.**, Philadelphia. He formerly was associated with Carbide & Carbon Chemicals Corp. and Link-Belt Co.

George Chipley will represent **Conoflow Corp.**, manufacturer of pneumatic final control elements, in Wisconsin. His headquarters are Milwaukee.

James A. Davis was named assistant to the president and general manager of **Electronicast Inc.**, Chicago.

T. A. B. Engineers Inc., Chicago, appointed **Robert Bigham** and **Jack R. Clemens** as project engineers.

Pittsburgh Steel Products Co., Pittsburgh, appointed **Michael J. Sonk Jr.** materials handling engineer in its Detroit office.

McAndrew McCall was named chief design engineer, construction department, Machinery Division, **Dravo Corp.**, Pittsburgh.

Fielding H. Yost Jr. was named manager of **Dow Chemical Co.'s** Cleveland office. He succeeds **D. T. Wellman**, who leaves Jan. 1 to become president, Wellman Bronze & Aluminum Co.

Stanley M. Vermeil was appointed secretary of the executive committee, **Keystone Steel & Wire Co.**, Peoria, Ill. He continues as assistant controller.

Robert D. Stottlemyer was appointed assistant division manager, Northwest Division, **National Supply Co.** with headquarters at Casper, Wyo.

Vic Hassell was appointed midwestern sales representative, Aircraft Parts Division, **Kaynar Co.** He will have headquarters in Tulsa, Okla.

Rear Adm. C. R. Todd U.S.N. (ret.) was appointed plant manager of **Continental Can Co.'s** Coffeyville, Kans., aircraft plant.

R. B. Miller will retire Dec. 2 as secretary-treasurer, **Thew Shovel Co.**, Lorain, O. He continues as a director. **Harry L. Reynolds** will become treasurer and **Waid V. Clark** controller and secretary.

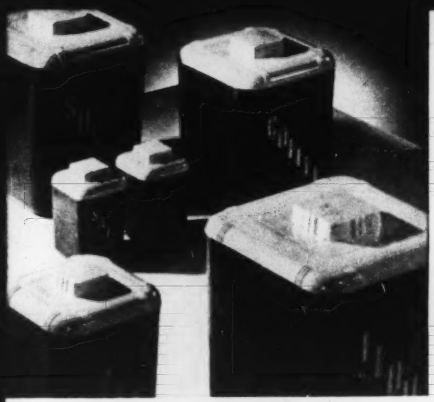
John H. McElroy, who retired as vice president, **Consolidated Car-Heating Co. Inc.**, Albany, N. Y., becomes chairman of the board.

J. E. Mullen, former vice president-sales, National Erie Corp., was appointed regional sales representative in Ohio and Pennsylvania for **Brad Foote Gear Works Inc.**, Chicago.

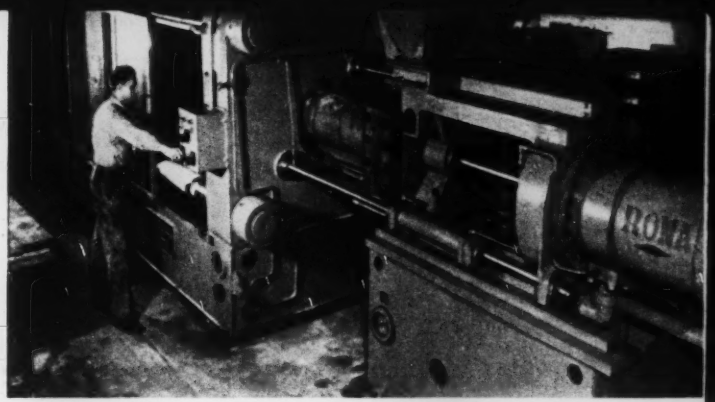
J. Willard Childe was appointed sales manager at Detroit for **Yale Rubber Mfg. Co.**

G. Gerald Misener was appointed purchasing agent, **Harper Electric Furnace Corp.**, Buffalo.

John Alico joined **Lake Erie Engineering Corp.**, Buffalo, as project engineer specializing in its forg-



NO MORE PROBLEMS. The production of plastic household items by Rona Plastic Corporation was slowed down by an inadequate hydraulic oil. A switch to Sunvis 999, over a year ago, restored it to normal.



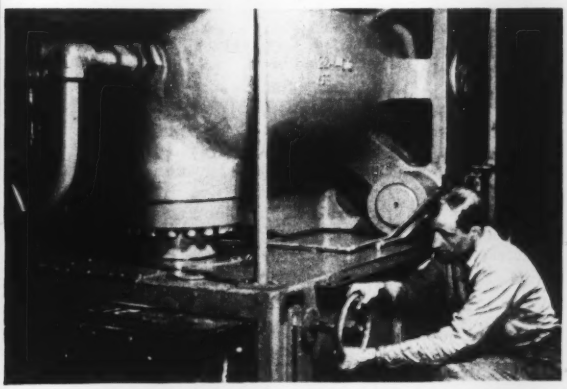
PRESSURE LOSSES ENDED. There are few plastic molding machines as big as this 60 ounce model. It exerts a pressure of 1,000 tons. Because the hydraulic oil formerly used sludged up and thinned out, it could not maintain this pressure. But Sunvis 999 has fully met these severe requirements, as well as those of Rona's nine other hydraulic machines of varying sizes.

PLASTIC MOLDER'S BOTTLENECK ENDED BY SUNVIS HYDRAULIC OIL

More than a year ago Rona Plastic Corporation, New York City, had trouble with its hydraulic molding machines. The machines functioned erratically due to oil sludge sticking the control mechanisms. In addition, the oil thinned out excessively at normal operating temperatures, and resulted in the loss of proper clamping pressures on the dies. To keep the machines going at all, it was necessary to drain, clean, and entirely recharge the systems at frequent intervals.

A Sun representative, called in by Rona, studied the problem and recommended Sunvis 999. He knew it would put an end to pressure losses, because, even at elevated temperatures, it does not decrease in viscosity as much as most other oils. He also knew its exceptional stability would end the sludging problem.

Sunvis 999 proved to be the answer to all Rona's hydraulic oil problems. The original charges, with minimum make-up, are still giving good service. Rona can expect the same performance for a long time to come, because experience shows that under normal operating conditions, Sunvis 900 Series Oils are *good for the life of the equipment.*



NO OIL CHANGES HAVE BEEN NEEDED. Before Sunvis 999 was adopted, the oil in each of the machines had to be changed frequently (the one pictured holds 450 gallons). The original charges of Sunvis 999 have been in use now for more than a year.

Department S-11
Sun Oil Company, Philadelphia 3, Pa.

I am interested in knowing more about Sun Hydraulic Oils. ☐ I would like to consult with a Sun representative. ☐ Send the booklet "Hydraulic Fundamentals and Industrial Hydraulic Oils."

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TECHNICAL ASSISTANCE AVAILABLE. Sun's engineers are at your service for consultation on all hydraulic oil applications. It will pay you to utilize the experience they have gained in solving a wide variety of problems in many different industries.

SUN INDUSTRIAL PRODUCTS

SUN OIL COMPANY, PHILADELPHIA 3, PA. • SUN OIL COMPANY, LTD., TORONTO AND MONTREAL

SUNOCO

H. W. TUTTLE JR.
H. W. Tuttle & Co. exec. V. P.

H. ALBERS
chief eng., Loewy press program

CHARLES T. EVANS Jr.
. . . joins Universal-Cyclops

ing and extrusion press applications.

H. W. Tuttle & Co., Adrian, Mich., announces organization changes as follows: **H. W. Tuttle Jr.** becomes executive vice president; **Herbert A. Speerstra** was named vice president and director of purchases; **Warren A. Stuckey** becomes vice president and works manager; and **Max D. Rosenstein** was promoted to vice president in charge of electronic research. Mr. Tuttle has been vice president-engineering. In his new capacity he will direct the company's expansion program.

Herbert C. Salzer was appointed assistant to the director of purchases, **Motor Wheel Corp.**, Lansing, Mich.

Ralph H. Stroth was made Indianapolis district manager for **Chase Brass & Copper Co. Inc.**, subsidiary, Kennecott Copper Corp. **Vincent Meyer** moves from Indianapolis to the Chicago district sales office.

Loewy Construction Co. Inc., subsidiary of Hydropress Inc., New York, promoted **H. Albers** to chief engineer in charge of the U.S.A.F. heavy press program.

John M. Tuthill, for nearly three years manager of flat-rolled sales in the general offices of **Youngstown Sheet & Tube Co.**, Youngstown, was appointed assistant general manager of sales with offices in Chicago. He succeeds the late **Arthur M. Long. L. E. Arnold** succeeds Mr. Tuthill. **Jay W. Owings**, assistant general manager of sales, Youngstown, has resigned to enter business at Magnolia, Ark. **Paul R. Rauch** was appointed assistant chief inspector for the Youngstown district with offices at the Campbell plant.

Don Stewart was named administrative assistant to the president at **Royln Inc.**, Glendale, Calif.

L. J. Call Jr. was appointed chief draftsman of **Hooker Electrochemical Co.**, Niagara Falls, N. Y.

Charles T. Evans Jr. was named manager of high temperature metals, **Universal-Cyclops Steel Corp.**, Bridgeville, Pa. He has been with Elliott Co. as director of development and metallurgy.

Russell L. Sylvester becomes manager of engineering and chief engineer, equipment division, **National Research Corp.**, Cambridge, Mass.

G. C. Danch joined **Ryan Aeronautical Co.**, San Diego, Calif., as executive assistant to director of engineering.

Catalytic Combustion Corp., Detroit, appointed **Paul H. Goodell** sales manager. He has been identified in the field of industrial heating for the last 15 years.

Chemical Plants Division, **Blaw-Knox Construction Co.**, Pittsburgh, promoted **C. F. Hauck** to assistant sales manager. In additon he continues as the division's manager of sales promotion.

OBITUARIES . . .

Ben H. Knipe, 63, president, **Markle Steel Co.**, Houston, died Nov. 14 following a brief illness. For many years he was an officer and member of the board of American Steel Warehouse Association.

Frank J. Clark, 72, salesman with **Hanson-Van Winkle-Munning Co.**, Matawan, N. J., for many years until retirement in 1948, died recently.

Russell S. Roeller, 60, general sales manager, **Pennsylvania Salt Mfg. Co.**, Philadelphia, died Nov. 12.

Walter C. Steubing Sr., president, **Lift Trucks Inc.**, Cincinnati, died Nov. 11.

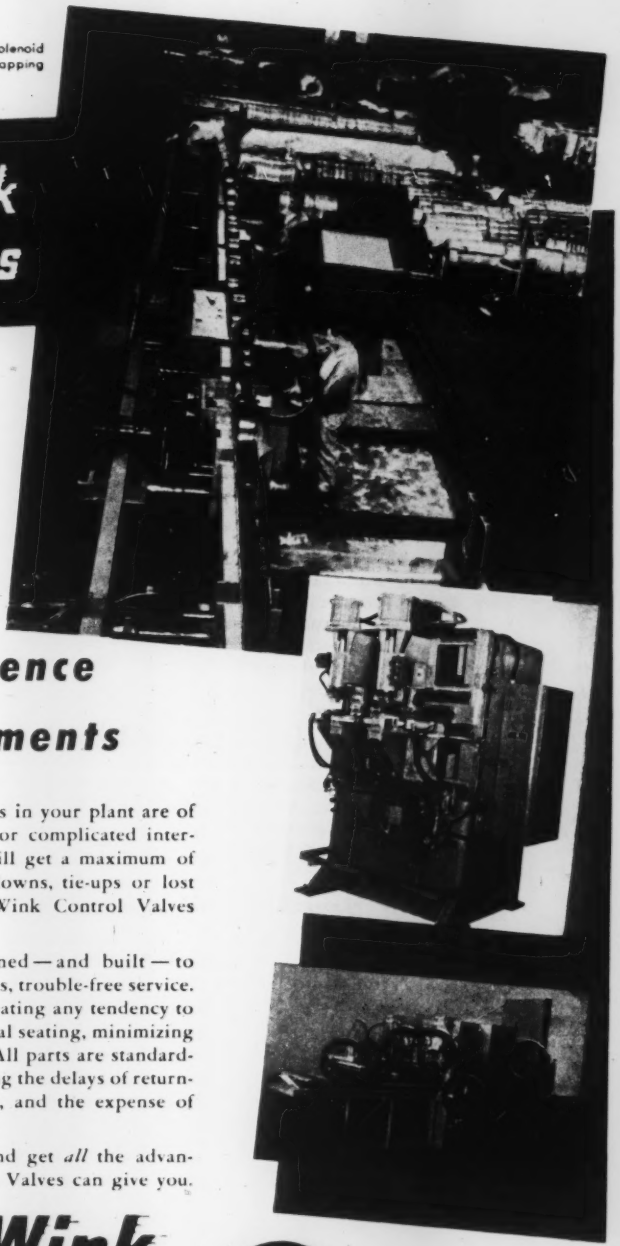
George G. Moody, 77, who retired 17 years ago as vice president and director, **Joseph T. Ryerson & Son Inc.**, Chicago, died Nov. 12.

Hiram C. Blair, 58, traffic manager, **Atlantic Steel Co.**, Atlanta, died Nov. 10.

Arthur K. Higgins, 44, assistant director of research, **Allis-Chalmers Mfg. Co.**, Milwaukee, died Nov. 6.

Quick-As-Wink Double Solenoid Air Valves on Coil Strapping and Oiling Line.

Quick-As-Wink Control Valves



fast, positive dependable action for single or sequence machine movements

● Whether the machine movements in your plant are of the relatively simple "on-off" variety, or complicated interconnected sequence operations, you will get a maximum of long, efficient service, without break-downs, tie-ups or lost time, by standardizing on Quick-As-Wink Control Valves throughout your plant.

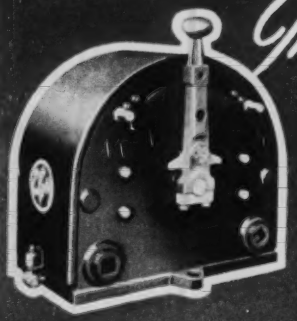
Quick-As-Wink Valves are designed—and built—to maintain highest standards of continuous, trouble-free service. All parts are in pressure balance eliminating any tendency to creep or crawl. There is no metal to metal seating, minimizing wear and reducing maintenance costs. All parts are standardized and readily interchangeable avoiding the delays of returning valves to the factory for servicing, and the expense of maintaining large standby inventories.

Standardize on Quick-As-Wink—and get *all* the advantages that *only* Quick-As-Wink Control Valves can give you.

Quick-As-Wink
AIR AND HYDRAULIC
Control Valves

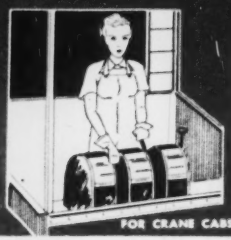
Hand, Foot, Cam, Diaphragm and Solenoid Operated

Mfd. by C. B. HUNT & SON, INC., 1911 East Pershing St., Salem, Ohio

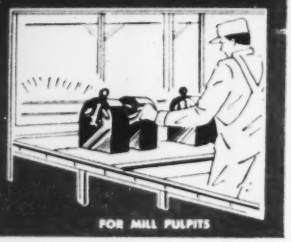


Improved CAM-TYPE SPEED CONTROL MASTER SWITCHES

by EC&M



FOR CRANE CABS



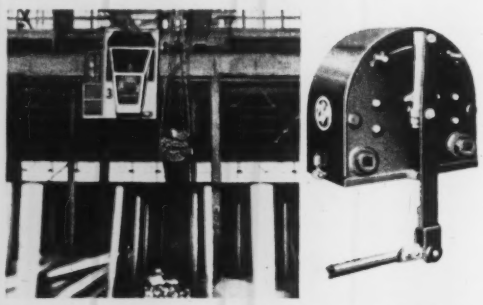
FOR MILL PULPITS

MAKE YOUR OWN COMPACT LAYOUTS with EC&M BULLETIN 1190-A CAM MASTERS

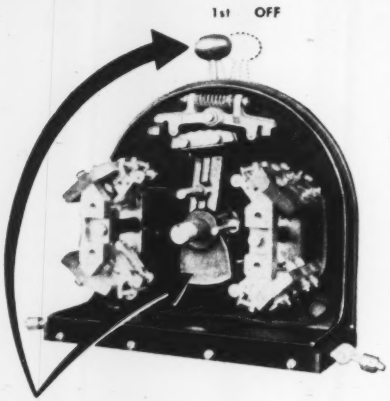
Ever popular with operators, these short-throw, narrow-width Master Switches have recently been improved, thereby increasing this popularity. The speed points are now more distinct without sacrificing ease and smoothness of operation. The views at the right show how this is accomplished.

Also, in many other ways, the EC&M Cam-type speed-control Master Switch is unmatched. Wiring space is generous—positive feed is connected to all common studs—large cams speed opening and closing of coin-silver contacts—overlapping cover excludes dust.

Write for New Bulletin 1190-A

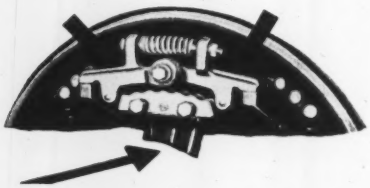


This clear view cab crane is equipped with EC&M under-lever Cam Master Switches which are supplied with extended-arm for attaching under-bar or tube.



Counterweighted aluminum arm eliminates advancing of arm by itself—makes each speed point distinct.

Two roller rails with roller pressure adjustable and equalized in both directions of travel make inching easy—either forward or reverse.



OFF POINT like the neutral position of an automobile gear shift lever.

THE ELECTRIC CONTROLLER & MFG. COMPANY

2698 E. 79th STREET — CLEVELAND 4, OHIO

Production AND Engineering
NEWS AT A GLANCE

LIQUID FLAME HEATING—Ajax Electric Co. Inc. demonstrated the method for the first time at the 1952 Metal Show in Philadelphia. This new use for salt baths offers advantages for selectively heating the periphery of circular work. Example is the hardening of gear and sprocket teeth. A number of the parts are mounted on a shaft so that only the teeth are immersed in the bath, and the work is then rotated. This technique is of special interest where it is desirable to avoid over-heating, scaling or decarburization.

OLD STANDARD: NEW HANDLING—System of holders widens the possibilities of gage-block applications . . . offers chance of taking them out of the tool room locker and putting them to use in the shop. Inherent accuracy plus simple setup assure rigid, precision device for production dimension control. p. 98

MOTORIZED RAILROADS—The dieselization of the nation's railroads may be only a way station on the road to electrification if the prediction of Westinghouse engineers is correct. Inexpensive electric power combined with the latest developments in electric engines is expected to make railroad electrification attractive again, not only for dense traffic lines but for light traffic lines as well.

MORE FOR LESS—Zinc fluoborate plating bath is being used for electrogalvanizing wire. One advantage over the conventional sulphate type solution is better conductivity, permitting higher production with existing equipment.

WORKBENCH RESEARCH—Faced with problems of failures in the field, a truck manufacturer sets up a testing department to duplicate the failures under controlled conditions. Results show dividends in extended life of many different parts. Room has electric power, steam, water and air lines in tunnels under the floor—ready for quick bench-test setups. p. 102

COSTLY CYLINDERS—Throwing money away is the way Burdett Oxygen Co. describes the action of company who lets demurrage charges on empty gas cylinders pile up throughout the year. At three cents a day per cylinder, it doesn't take long before this needless waste gets out of the penny ante class.

CHROME PLATE TAKES BEATING—Results of tests conducted in a steel mill show that a layer of chromium plating offers dividends when it's used on fast-wearing members. The life of moving parts has been increased particularly in applications where dust, gases and other contaminating agents tend to foul up smooth functioning. Packing life is increased. In the cases where scoring occurs the repair time is drastically reduced since the machine often can be repaired without disassembly. p. 108

TAKES THE HEAT—Magnesium alloyed with rare earths and zirconium is proving its worth in castings for use at elevated temperatures. Latest addition, now in initial foundry production and prototype engine evaluation, is HK31 containing 3 per cent thorium and 0.6 per cent zirconium. Improved creep resistance in jet engines in the use range above 500° F is the pay-off.

ONE COAT COVER—One large appliance manufacturer has found that complaints of chippage are virtually non-existent on parts where a single-coat porcelain enamel finish is used. This is attributed largely to the thinness of the coat, between 0.0035 and 0.006-inch. This is close to the thickness of a paint finish.

CALIBRATE TO LUBRICATE—A simple calibration process recommended by the Navy's Bureau of Ships can make grease gun lubrication more efficient. The process results in a chart being attached to each gun giving definite figures for ounces-per-stroke, strokes-per-ounce and strokes-per-cubic inch. Benefits are savings in lubrication time, elimination of waste and lessening of the chance that vital parts will be under lubricated.

MAGNESIUM NOTES—Jet technology will challenge magnesium fabricators as temperatures push higher. L. C. Mallet, assistant general manager, Pratt & Whitney Aircraft Division, says recent types of jet engines may contain less magnesium than previous ones as stainless steel and titanium crowd to the forefront for hot zone applications. Metallury of magnesium alloys with rare earths and zirconium is making rapid strides. Magnesium-lithium alloys are at present not stable enough for commercial products. Microshrinkage is not the bugaboo it once was. Foundries are fast learning new tricks to cast magnesium. Still, wrought product applications have gained faster, relatively, than cast products in the past three years.

SKIN FORMING STUDIED—A military tooling panel is surveying the industry to determine future requirements for high tonnage skin forming. Results of the survey will be discussed with suppliers of skin stretching equipment and with the mills to determine anticipated equipment requirements for the aircraft industry.

This photo shows an application of the large indicating snap gage using the precalibrated dial indicator, extra long gage blocks and a long holder

GAGE BLOCKS: New System Widens Applications

Mechanical difficulties of assembling gage block into an effective everyday measuring tool are overcome by new gaging aids. System speeds up construction of gaging setups

IT'S GENERALLY recognized that gage blocks are one of the most accurate measuring standards for industry. Yet they are frequently locked in vaults and seldom used.

The direct use of gage blocks in establishing industry's tool dimensions—the dies, jigs, fixtures, etc., can prevent wasted production because errors of inherently less accurate instruments are eliminated. Equally important, the errors are eliminated that result from the transference of measurements from gage blocks to other instruments.

In many shops today the methods and instruments used for making measurements are primitive in contrast to the accuracy obtainable with gage blocks. Gage block accuracy is becoming important not only in producing industry's tools but, in many cases, is important in producing the end product itself.

The Stumbling Blocks — What limited the direct use of gage blocks for everyday gaging operations was the mechanical difficulties involved in assembling these measuring rods into a practical measuring tool. These difficulties in handling, which arise from the physical form of the gage block itself, have not been completely overcome due to the inadequacy of the gage block holders and accessories previously devised.

These difficulties are overcome by series of gaging items developed by DoAll Co., Des Plaines, Ill. They are intended not only to speed up the construction of gaging setups with U.S.A. type gage blocks, but also to provide a means for realizing greater utility from gage blocks by permitting the construction of instruments for any gaging or scribing operation. Each is designed to augment the use of the other items in the series in conjunction with gage blocks. Together, the entire series constitutes a complete gaging system.

Heart of System—Nucleus of the Micro-Step gaging system is a series of gage block holders and end standards. The holders permit setups up to 72 inches long in increments of as little as 0.000025-inch. Several holders can be assembled together to construct gages 6 feet or more in length.

The end standards may be con-

sidered functional gage blocks. They incorporate the working surfaces (gaging or scribing) needed for constructing measuring instruments — their dimensions within gage block tolerance are known.

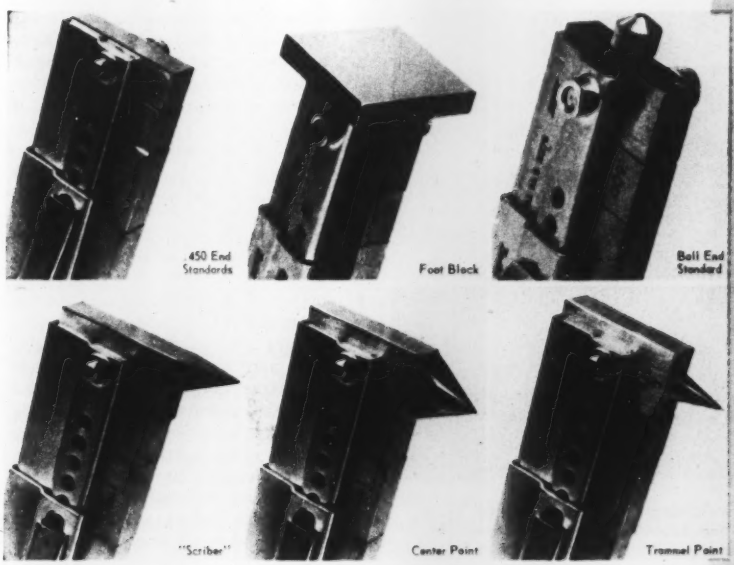
Beauty of the system is the ease with which the holders, end standards and gage blocks can be assembled, plus the fact that the end standards (as implied by their designation) can be fastened directly at the ends of the holders. When so fastened they present a full uninterrupted surface beyond the ends of the holders. This latter feature increases the versatility of the system since it eliminates the end obstructions ordinarily created by mechanical fittings used for assembling and holding the gage blocks together.

Previous Drawbacks — Other clamping mechanisms allow some of the block end to be exposed but obstruct the center area of the block—the area most accurately calibrated. Some of the methods permit assembly of combinations only in relatively large increments so that the in-between dimensions are not readily obtainable. End obstructions limit the variety of gages that may be constructed, for example, a pin gage for checking deep bores, because the penetration of the gaging surfaces into the bore is limited by the obstructions.

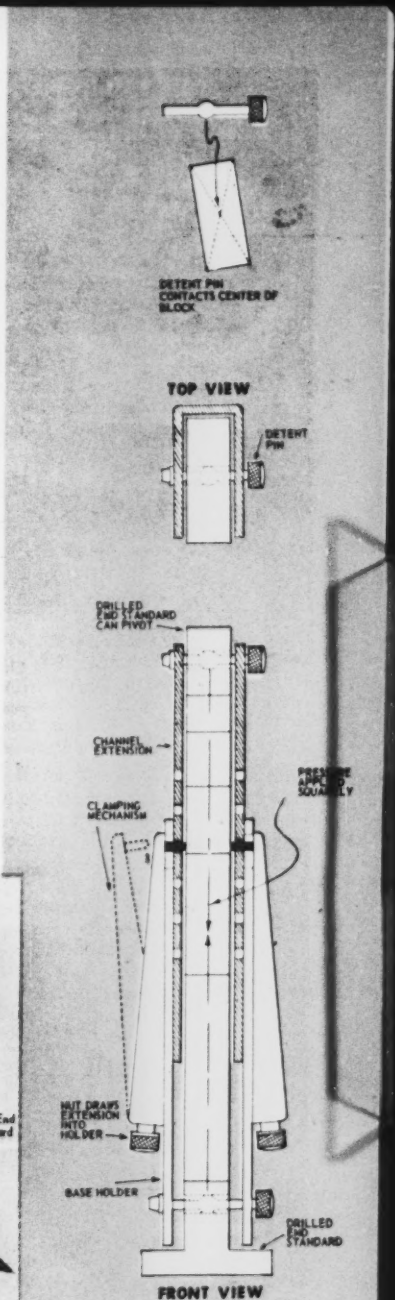
The holders in the new DoAll system are comprised of channel-type holders in graduated sizes which collectively embrace a usable measuring range of from 2 to 72 inches; one caliper holder (1 to 6-inch range), ideal for outside and inside calipers, dividers or scribing compass and many other balanced assemblies. This holder, a channel-type, consists of a channel extension and a base holder. To form a complete holder, an extension is slipped into the base holder. Different sizes cover different measuring ranges.

Ease of assembling gages is aided by a clever detent pin arrangement. A captive type pin is employed at each end of every extension and base holder. End standards are drilled to the diameter of this pin.

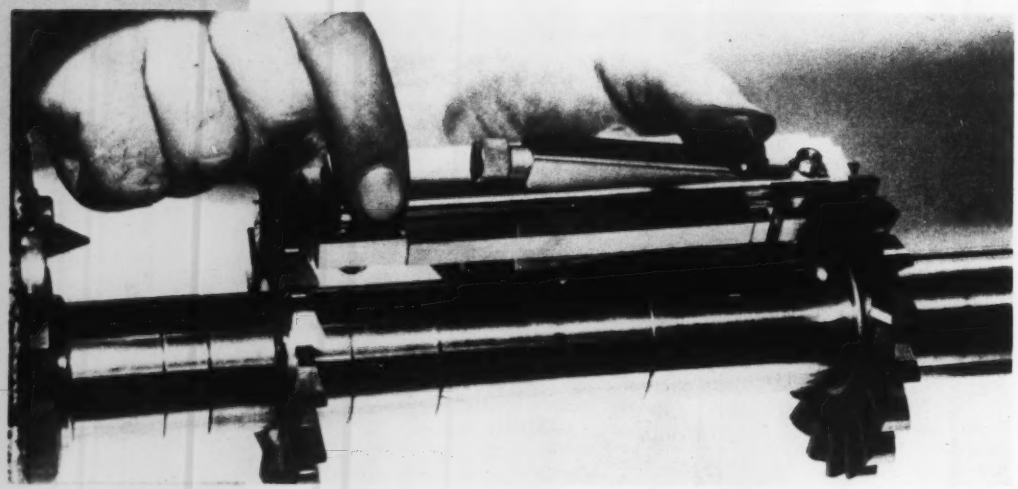
Snaps in Place—In attaching an end standard it is simply inserted in the holder at the desired end and its hole aligned with the detent pin hole. The detent pin is pressed



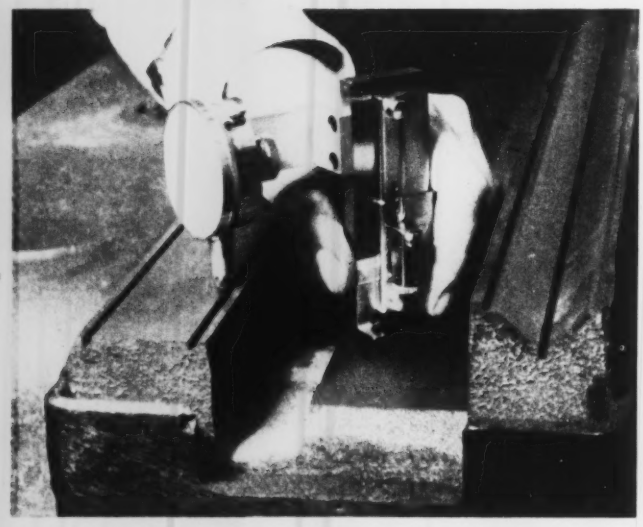
Some of the end standards in the Micro-Step system. End standards are made for every conceivable gaging and layout operation. Note exposed ends of the gaging pieces



Schematic showing principle of gage assembly with gage blocks and the Micro-Step gage holder



Checking the distance between milling cutters a good example of how exposed gage ends provide advantages



Indicating height gage with foot block and precalibrated dial indicator being used to check difference in height between ways of a surface grinder

through the end standard to the opposite wall of the holder where it snaps into a lock bushing. The gage blocks required to complete the desired dimension between the working surfaces of the end standards are slipped into the holder, and the entire assembly is clamped together with the thumb screw mechanisms appearing at the sides of the holder.

The detent pin assures positive contact between the components of the gage and provides rigidity to the entire assembly. To clamp together the blocks and standards in a holder, the channel extension is drawn into the base holder by means of the thumb screws at the sides of the base holder. The thumb screws are on L-ended threaded rods and the L-ends of these rods hook into holes in the side of the channel extension. When the rods are drawn down by the thumb screws the extension is drawn down also into the base holder.

Pressure Applied Squarely—Because the end standards float on the detent pins they are able to pivot and adjust to the parallelism of the gage block combination. Free pivoting in all directions is assured by the design of the detent

pin which has a ball-center shaft and thus makes spot contact with the end standard. Pressure is therefore transmitted squarely against the adjacent gage block and through the entire combination. If some blocks are not aligned, this squarely applied pressure is assurance of rigidity and stability in setups up to 72 inches long.

Because of the end accessibility afforded by the holder design, it was possible to design new end standards that permit innumerable setups. Some of the new end standards include:

Foot Blocks—T-shaped that can be used as a small base block to provide a firm base for constructing gages up to 25 inches in length. They can be used as a platform at the top of a combination for setting dial indicators or other gages.

Ball End Standards—These blocks include long-wearing, sapphire ball points. A pin gage for checking deep bore diameters is readily assembled by using one of these standards at each end of a combination. They may also be used as the points of a snap gage or as a point anvil for a dial comparator.

Knife Edge Caliper Bars—Used at each end of a combination they provide a means of checking concentricity of bores, etc. They may also be used to provide a knife anvil for a dial comparator or as caliper bars for checking outside diameters.

Base Block — Provides an extremely stable base for unusually long combinations. As many as three individual setups can be constructed on this block. With two setups, for example, such as a dial indicator and an anvil setup, a dial comparator is constructed. Two setups on this block can also provide a convenient means for checking go and no-go tolerances.

Indicator Precalibrated—An outstanding development in the category of end standards is the precalibrated dial indicator set, consisting of a dial indicator, several calibrating blocks and several brackets for attaching the indicator to a calibrating block. The indicator-equipped block can be instantly calibrated and placed at the end of a holder as part of an indicating setup. Further calibration of the completed setup is not required.

Calibration of the block-indicator assembly is remarkably easy. Where the dial indicator is fastened to the 3-inch block, for example, the spindle tip of the indicator is effectively on a level with one end of the block. By placing this end of the block on a surface plate, the spindle tip also will rest on the plate and can be quickly calibrated, zeroed, to the end of the block. A dial indicator setup is then constructed quickly without further calibration by placing the indicator-equipped block in a block combination of the dimension to be checked.

If an external height indicator is being constructed, for example, the indicator-equipped block is fastened at the holder end with the calibrated end toward the block combination in the holder. The setup is then ready to use and no further calibration is required since the spindle tip is zeroed to one end of the associated gage block and this end is adjacent to a combination of the desired height.

Several Indicator Positions—The three mounting brackets included in the set permit the indicator to be mounted in various positions with relation to the holder. For example, the indicator can be placed in-line at one end of a combination in constructing an indicating pin gage for checking bores, or a height gage for checking the height of an undersurface.

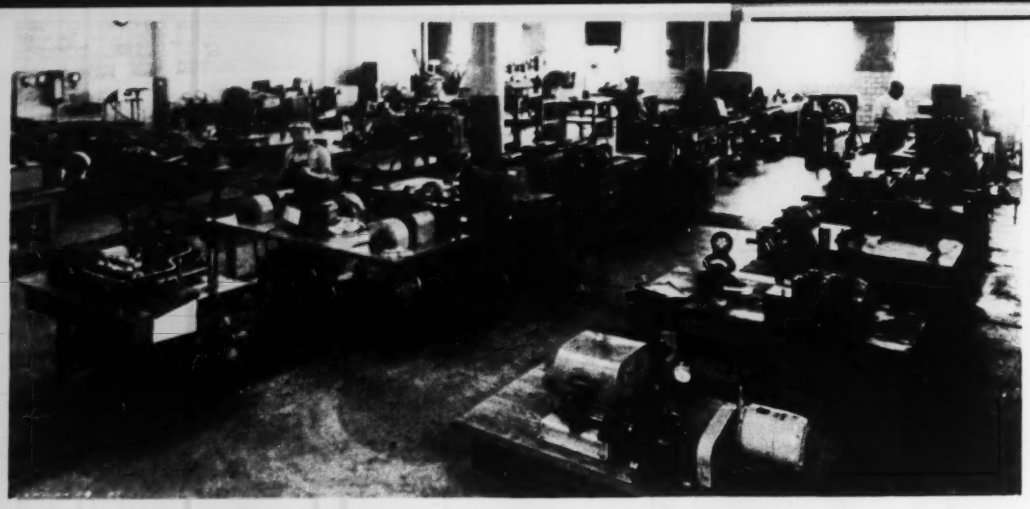
The caliper holder constitutes a unique development in gaging history. Ends of the caliper arms carry detent pins for holding standards such as caliper bars, ball, trammel or scriber points, dial indicator, etc., required for making caliper checks, scribing an arc, checking bores, etc. The required blocks are placed between the mounted end standards and the caliper arms are drawn together by means of a knob atop the caliper. In this manner the slack is taken up between the blocks and standards, and sufficient pressure is applied to bring the entire assembly together.

Plus User Aids—An important accessory to the gaging system, is a publication that speeds up and simplifies the selection of gage blocks for constructing a desired dimension. It includes height-combination tables which list directly the blocks to be used in forming combinations for each dimension in the range of 0.0001 to 0.9999-inch in steps of 0.0001-inch, a total of 10,000 different dimensions. What is more helpful still, two alternate or "substitute" combinations are listed for each dimension, giving the user a choice of three combinations for each dimension. The latter is an invaluable aid in enabling the user to construct the desired dimension even when certain blocks required for the initial combinations are not available, or when duplicate dimensions are needed.

The heat-expansion calculator, included in the book with the tables, gives the corrections that must be made in the heights of combinations used for checking parts other than steel at temperatures above or below the standard measuring temperature, 68° F. Amount of correction for all kinds of materials, and for the specific size being checked is read right from a chart.

Extra Blocks — A set of eight gage blocks ranging in length from 5 to 20 inches is also part of the new gaging system. These are used for constructing long combinations up to the 72 inches permitted by the holders. The same degree of accuracy is maintained in these blocks as in the shorter blocks. Other items include: A set of 35 blocks incorporating very thin gage blocks for the construction of dimensions below 0.200-inch, vernier gage blades, 5 and 10-inch sine plates and visible scale. Included among the thin blocks are those graduated in steps of 25 millionths of an inch which enable combinations to be constructed in increments of 25 millionths for checking tolerances in which tenths are split.

The vernier gage blocks permit measurements in increments of 0.000010-inch. Appreciably larger working surfaces for precision checking angles on large work pieces is afforded by the sine plates. Part of the series of optical gaging items which includes optical flats (1 to 10 inches diameter), Monolite, etc., the visible scale is an adjustable grid that simplifies reading of a pattern produced by interference bands.



Benches receive services like electric power, steam, water and air from plate covered tunnels underneath. About half the department is shown here

Bench Tests Solve Field Problems

A small department demonstrates its ingenuity and flexibility by providing a means for evaluating changes in many units quickly, cheaply and accurately

By GIL F. RODDEWIG
GMC Truck & Coach Division
General Motors Corp.
Pontiac, Mich.

ADVANTAGES of bench testing have been recognized for some time. Such testing provides a means for evaluating changes or improvements in many units quickly, cheaply, accurately and without delay from weather conditions. Tests at GMC Truck & Coach cover a great variety of truck and bus components.

Generally, requests originate from service complaints which indicate too much trouble is being experienced with some particular unit. Our first step then is to set up a test which will produce the failure or difficulty being complained of and record the time or number of cycles required. Then with a base line established, tests continue on suggested improvements until we come up with a correction which will provide a definite increase in service life as shown by the test record.

Frequently, too, we are asked to test a part or assembly of a new design on which we have no field experience. In such cases a procedure or method is agreed upon with the design engineers and invariably some weakness is brought out which when known, can be eliminated.

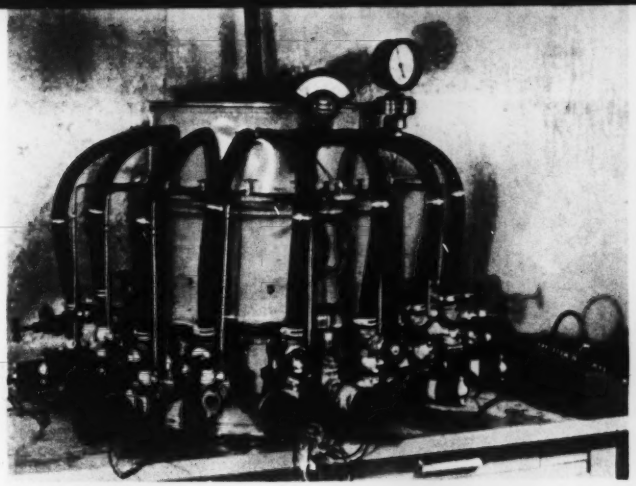
Right Test Needed — Considerable judgment must be used in establishing the test procedure. If a break-down is accelerated by test conditions that are too severe you may be kidding yourself into providing a better correction than is required. On the other hand, if procedure is too mild, you may accumulate many test hours and conclude that little or no improvement is required. It always helps to have a failed sample of the unit to be tested returned from the field, and then arrange a procedure which will duplicate the same condition in 20 to 50 hours of testing for a base line.

Test stands are arranged in rows over plate covered tunnels in the floor. In these tunnels are such services as 6 and 12 volt dc current; 110 and 440 ac; water, steam, illuminating gas, air pressure and an exhaust gas line. All are arranged so that it is possible to connect into any or all of them practically anywhere in the department.

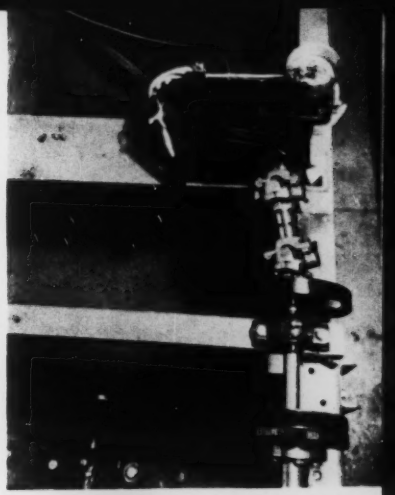
Keep It Simple—We have a few large tables on which we mount several setups but generally speaking, a separate stand or bench is used for each test. Three men comprise the entire day crew in this department. In addition, there are two men on the second shift, and one on the third.

A relatively simple setup is used to check the life of a truck transmission poppet and shift rail assembly. A double acting cylinder pushes and pulls on the gear shift lever, simulating shifting the rail and actuating the poppets. An electronic timer energizes the magnet valves which admit air pressure alternately to both ends of the cylinder. An electric counter records the cycles and it too is actuated by the timer.

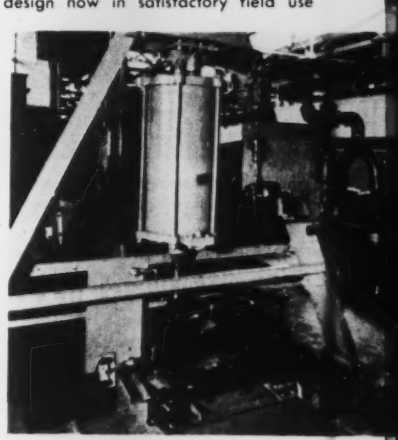
No Waste Space — An arrangement for checking 18 electric motor driven water pumps used in some coach heating systems illustrates how a number of units can be tested in a small space. From this setup data was obtained on pump seals, motor bearings and brushes, current consumption and water pump capacity. Valve in discharge line controlled the pressure



Arrangement for testing 18 motor-driven water pumps used for coach heating permits savings in space needs



Endurance test on engine timing gears located under cover provided data for design now in satisfactory field use



Comparing standard truck spring with a challenger requires test where both components get same rough treatment

so that all units were operating under same load. Pressure of any individual pump could be checked at any time by opening valve connected to pump discharge and leading to gage manifold. Discharge volume was checked by timing the delivery of a given quantity of water.

Current consumption of any motor was determined by reading amperes and volts from switch panel at the right and readings were taken on each eight hour shift. Any pump can be removed from test by shutting off the intake and discharge valves and then disconnecting a flange fitting.

Broad Test Range—A test on the packaging of military truck parts boxed for overseas shipment uses a cradle rocked on its pivot by air cylinder. At the end of each stroke the end of the cradle is bumped on the wood blocks fastened to the floor giving the box and its contents a jolt in opposite directions.

Examinations of contents after a given number of cycles disclosed a few shortcomings in our packaging procedures. From repeat runs on parts processed with improved packaging methods, damage in shipment was practically eliminated.

This same setup is found satisfactory for testing fuel tanks. The rocking and bumping of the cradle creates the same effect on mounting straps, tank ends, and internal baffles as many thousand miles of actual service.

Checking Claims — Comparing two truck springs, we have the standard or production spring and the one that some supplier has assured us will do the same work for less money or more work for the same money. Both springs are deflected the same amount, the deflection rate and load are the same and so provide a direct comparison. Such a test is useful too for comparing life of spring pins and bushings. Two large mufflers silence the exhaust from the air cylinder The power cylinder is 12 inches in diameter which can produce a push of 11,300 pounds with 100 pounds of shop line pressure. The stroke is 30 inches. A lever can be used for greater loads if required as was done in this case.

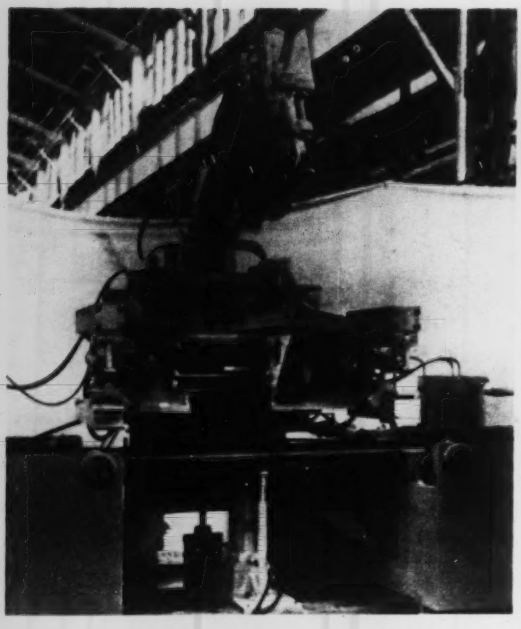
Illustrated is an endurance test on engine timing gears which are located inside the timing gear cover. In the driving shaft connected to the crankshaft gear is a small flywheel and a double jointed propeller shaft. The joints in this shaft are assembled 90 degrees off the conventional manner. Further, the shaft is running at quite an angle. This sets up an uneven rotation in the crankshaft gear.

Flexibility—Inside the box and connected to the camshaft gear we have another small flywheel which provides some resistance on the driven gear to the uneven rotation of the driving gear. The severity of this test can be increased or decreased by changing the angle of which the joints are run or by changing the weight of the flywheel connected to the driven camshaft gear.

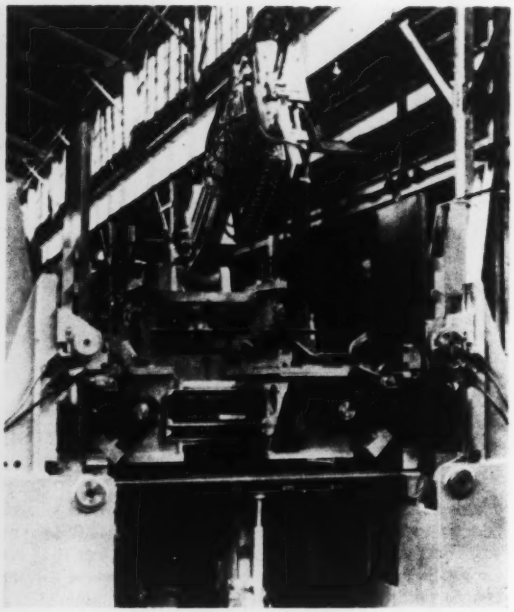
The first set tested ran only 35 hours and from that first run we learned that we had three different problems with our camshaft gear. First, the attachment of the gear to the shaft. Second, the bond between the aluminum gear and the steel hub and third the wear on the teeth.

Before these gears were considered satisfactory we made 18 or 20 runs but we finished with a construction or design which ran 300 hours consistently on the machine previously described.

Based on a paper presented at the SAE National Transportation Meeting, Oct. 22-24, 1952



Appliance cabinet component already cut to length enters machine for forming, welding operations at start of cycle



Second operation shows the cabinet starting to take form as both ends are bent simultaneously and to exact dimensions

Combined Welding and Forming

Lower Appliance Costs

Single machine performs both operations requiring only one operator and affords savings in floor area requirements. Need for sizing fixtures is eliminated

By JOHN MALONEY
Sales Engineer
Federal Machine & Welder Co.
Warren, O.

DEMAND for a combination forming machine and welding machine for appliances is answered through the joint efforts of the Struthers Wells Corp., Titusville, Pa., and the Federal Machine & Welder Co., Warren, O.

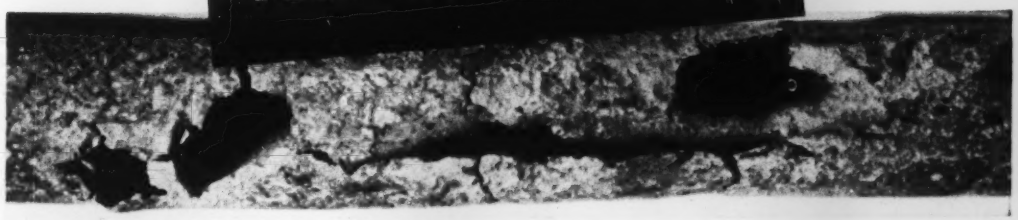
These machines are presently being produced to form and weld a wide range of appliance cabinets and liners. The combination machine consists of a Struthers Wells Quadruplex tangent bender with a Federal welding component mounted on a beam which is raised and lowered with each machine sequence to make the forming operation possible.

Material is first placed in the lower dies of the bending machine and then the operator presses a button to start the fully automatic forming and welding cycle. The bender forms the cabinet to the desired shape and the last bender operation actuates a limit switch which initiates the automatic welder cycle. At this point, the welder beam is lowered and automatically latched to the male bender die. The welding guns then engage the cabinet and make the welds.

The guns retract, the beam unlatches and raises to dwell position. At the same time, the welding beam starts to retract the bending wings of the tangent bender also return to their initial position. The cabinet assembly is then automatically lifted to a position where it will easily clear the male die for unloading.

Money and Manpower—Production costs are materially reduced by an installation of this type compared with conventional methods of forming in a bender and then transferring to a separate weld station. Only one operator is required to perform both operations

research at work!



Photograph of a section of a failed tube showing excessive thinning and pitting of the outer surface. Note also the circumferential cracks.

CORROSION STUDIES CAN INCREASE THE ECONOMY OF COPPER ALLOYS

Copper and its alloys are notable for their resistance to corrosion under a wide variety of conditions. There are industrial applications where copper or the appropriate copper alloy should give an indefinitely long life, but where failure because of corrosion may result by reason of unsuitable design of equipment or improper control of environment. Further, there are many situations in which no commercial metal or alloy will have an extended life, but in which copper or one of its alloys possesses a combination of physical and chemical properties which render it the best obtainable material, when all factors, including ultimate costs, are taken into consideration. Hence correct specification becomes of great importance. Recognition of this by industry is responsible for the fact that the Revere Research Department devotes so much time to studying the corrosive effects of fluids and gases, and to preventive measures.

Recently a large manufacturer, who produces condensers as well as other equipment, reported that arsenical Admiralty tubes in a steam-jet ejector were failing after five years. This length of service is not too bad, but nevertheless such tubes often last much longer. Could we make any suggestions?

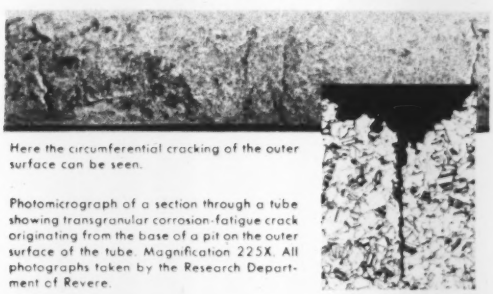
Seven failed tubes were examined for type of corrosion, metal and scale analysis. The facts were: outer surfaces were badly pitted and grooved with holes completely through in some areas; the inside surfaces were relatively untouched; cracking was circumferential, progressing from the outside; outer scale was largely cupric carbonates and copper sulfide; inner scale was calcium carbonate, cuprous oxide and some iron oxide. Microscopic examination of the cracks showed they originated in corrosion pits on the outside, progressing inward across grain boundaries, rather than along them. The transgranular path of fracture, together with other characteristics of the microstructure, definitely established the fact that the failure was of the corrosion-fatigue type. The corroding pits on the outside created stress concentration points of weakness, from which the cracks originated. Eventually the localized stress exceeded the endurance limit of the metal and it cracked.

The conclusion was, therefore, that damage was from two sources—the first being excessive carbon dioxide and the other non-condensable gases in the steam, which caused the excessive pitting and thinning. It is not unusual to have these and other corrodants present in damaging amounts in the air-ejector system, whereas they are not injurious elsewhere. The second cause of failure was excessive vibration somewhere in the unit which was responsible for the corrosion fatigue failure.

RECOMMENDATIONS. The copper-base tube alloy that generally possesses the greatest resistance to the non-condensable gases responsible for the corrosion of the Admiralty tubes is 5% aluminum bronze. Re-tubing with this was suggested. It was also recommended that steps be taken to effect a material reduction in tube vibration by placing a baffle in the steam inlet. In addition, it was pointed out that many operators find it good practice to discharge the after-condenser drain to the sewer instead of returning it to the system. By this means, the amount of carbon dioxide, ammonia and other gases in the system can be substantially decreased.

* * *

It is interesting to note that the Revere Research Department, located in Rome, N. Y., was able to determine these causes and suggest remedies without ever having seen the condenser. This is the result of modern equipment, and long experience in studying the problems of corrosion. If you have a problem regarding the corrosion of copper and copper alloys, or aluminum alloys, why not take it up with the nearest Revere office? Remember, corrosion that is too rapid wastes both your money and our national resources.



Here the circumferential cracking of the outer surface can be seen.

Photomicrograph of a section through a tube showing transgranular corrosion-fatigue crack originating from the base of a pit on the outer surface of the tube. Magnification 225X. All photographs taken by the Research Department of Revere.

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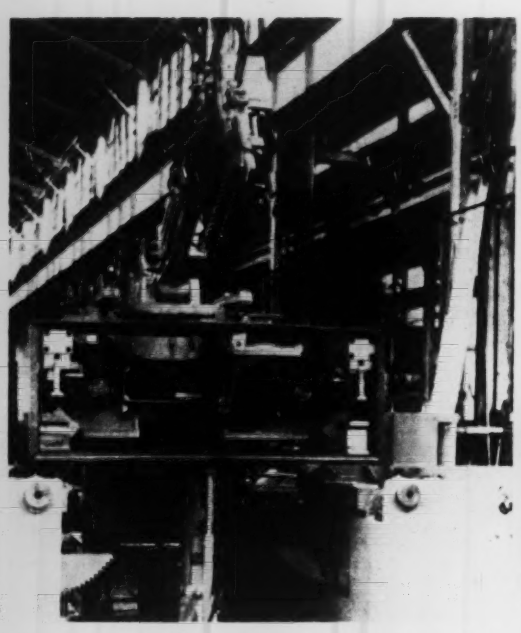
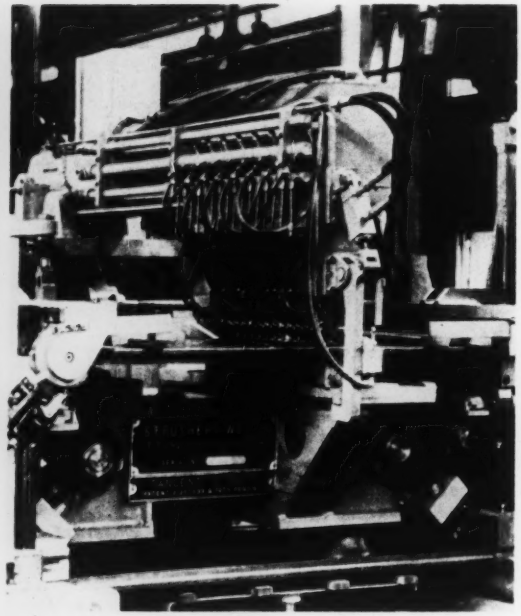


Third operation completes final shape of the cabinet. This step actuates limit switch to initiate the welding cycle



Welder beam is lowered and automatically latched to male bender die, guns engage, welding operation takes place

in this single combination machine.

Combining of the welding and bending machine also saves valuable floor space. Not only is the floor space occupied by the welding machine saved, but also, the large area required to store unwelded assemblies is also saved. This amounts to considerable plant area, particularly in the manufacture of freezer, washer and dryer cabinets, liners, etc.

On the Nose—Since the weld is made while held to size in the bender there is no need for over-forming, which also eliminates sizing fixtures. No finer sizing and holding fixture could be found for the welding machine than the die forms of the bending machine. Location problems in the welding machine on these assemblies is eliminated.

The welding component that is shown in the photographs is designed with a series welding circuit, the series die being incorporated in the male die of the bender. For heavy gages, direct welding is used. Units are designed where the welding guns index, and in this way, the spacing on any series circuit can be enlarged to give the most ideal welding conditions.

One manufacturer of washing machines is considering the incorporation of a travel head seam welder in combination with a tangent bender. Another combination is being built for welding an aluminum shroud and provisions are being included for automatic tip dressing of the electrodes while the beam is in the raised position.

The welder unit features the latest developments in welding machine design, incorporating package transformers wherever possible. The secondary connections, the mounting connections of the hydraulic guns, the adjustments, etc., are designed with maximum accessibility in mind, both for the operator and for the maintenance man.

Future prospects of combining both welding and forming machines offer the greatest opportunities. There is a possibility of going far beyond just forming and welding the shroud assembly. In addition to the forming of the shroud and joining it by resistance welding, there is also the possibility of welding other parts to the assembly in this operation.

Paper Bond Ups Hammer Work

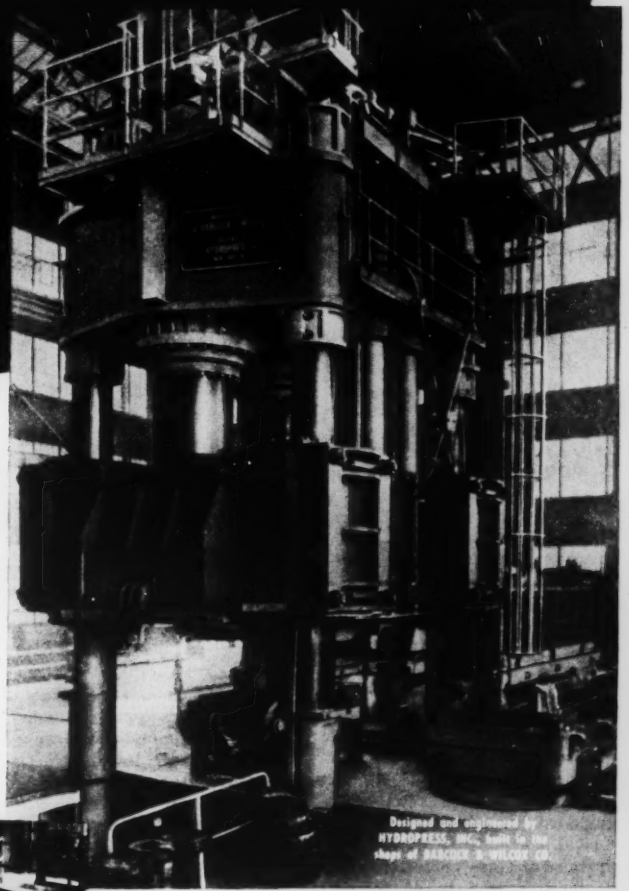
Large economies and production benefits in their six giant drop hammer forming operations through use of Tekwood, is reported by Castle Industries Inc., Everett, Wash. Tekwood is a laminated combination of heavy cylinder kraft paper bonded to both sides of a hardwood core.

The company found that by placing about eight sheets, $\frac{1}{8}$-inch thick, of Tekwood around the base die, 95 per cent of all corner wrinkles were eliminated and production increased considerably. The material can also be annealed for use on difficult contours and overall savings extended into hand finishing operations.

The paper, it was stated, provides a firm buffer around the die, yet is plastic enough to allow correct stretching of the material. Tekwood is a product of U.S. Plywood Corp.

"the nation's largest press

-- says BABCOCK & WILCOX
for whom HYDROPRESS, INC.
designed and engineered it



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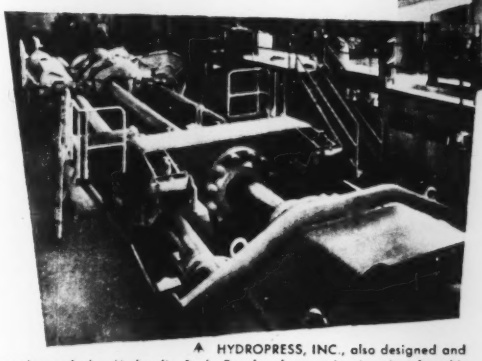
▲ 6,500 Ton Hydraulic Piercing and Bending Press — intensified capacity 8,500 Ton — at the Boiler Division, BABCOCK & WILCOX, Barberton, Ohio.



▲ HYDROPRESS, INC., also designed and engineered the Hydraulic Push Bench — largest in America for this purpose — on which BABCOCK & WILCOX draws the Ingots or billets of varying cross sections — pierced on the press shown above — into seamless Steel Tube and High Pressure Vessels from a minimum of 8" I.D. up to max. 26" I.D., 4½" Wall Thickness and 22 feet length.

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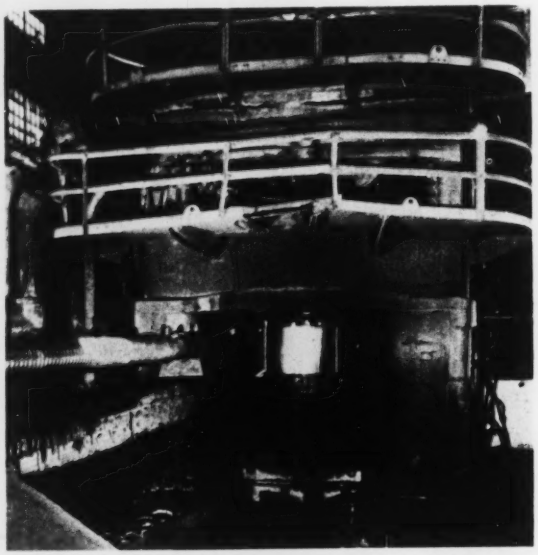
Chromium Plating Pays Off for Steel Mills

Operating costs and maintenance downtime drastically cut with chromium plating. Process whips corrosion and adds packing life



Chromium plating ram on 3000-ton shear halted rapid rate of wear caused by scale. Plating thickness averaged 0.010-0.12-inch on both 24 and 40-inch diameters. (All photos courtesy of the Chromium Corp. of America)

INCREASED LIFE and reduced maintenance of steel mill equipment is being realized with chromium plating. Applications are not limited to one or two pieces of equipment. Chrome plate has paid off in many phases of steelmaking.

Chromium plate for engineering uses is usually applied directly to the steel surface in thicknesses seldom less than 0.001-inch. This contrasts with decorative chromium plating at 10 to 20-millionth inch thickness, over nickel plate. Also, many properties other than the decorative requirements of color and brightness become significant.

Advances in technique for plating chromium and existence of equipment for handling heavy and unusual components have greatly expanded the use potential. Pieces weighing from 5 to 45 tons are chromium plated today with increasing regularity.

Where do steel mills use chromium plating? This question was answered for metal technologists attending the 1952 convention of Association of Iron & Steel Engineers by John B. Allen and Jerome D. Tullock, Chromium Corp. of America, Chicago.

Core Making — Starting with the coke plant the development of a successful application on crosshead liners resulted in trouble free operation where gases, condensate and abrasion made for continuous replacement. The cast iron liners are chromium plated approximately 0.008 to 0.010-inch thick, and finished to a smooth semilustrous surface within acceptable limits. Corrosion is eliminated and the ability of chromium to prevent galling and seizure maintains the liner in top condition with no loss of efficiency for extended periods. Other applications here include cross-head guides, power pistons, and quenching valve piston pots.

Blast Furnace—In the blast furnace division, a number of potentially valuable applications are on trial, such as, bucket guides, control valve rods, and hopper segments. Soon to see service will be several one piece chromium plated revolving hoppers, plated on the outer surface to combat wear and corrosion, thus maintaining an effective seal and free rotation without tearing out sealing rings. Experimental work has also been done on mud gun liners, taking advantage of the extreme hardness of chromium to reduce wear.

Other Parts, Too—In the open hearth, chromium plating has potential use on hydraulic equipment. It is also being used on ladle crane axle bearing surfaces. The crane axles are being plated regularly for wear resistance to combat the adverse effect of dust in the bearings.

The rolling mill division, specifically slab and billet mills, have used chromium in applied hydraulics particularly. Here plating is successful on roll balance plungers, shear rams and pull backs, accumulator and intensifier plungers and ingot tilter plungers.

These units are subject to severe operating conditions and are exposed to hot flying scale, condensate and corrosive waters, silt in the hydraulic system and con-

CHROMIUM PLATE

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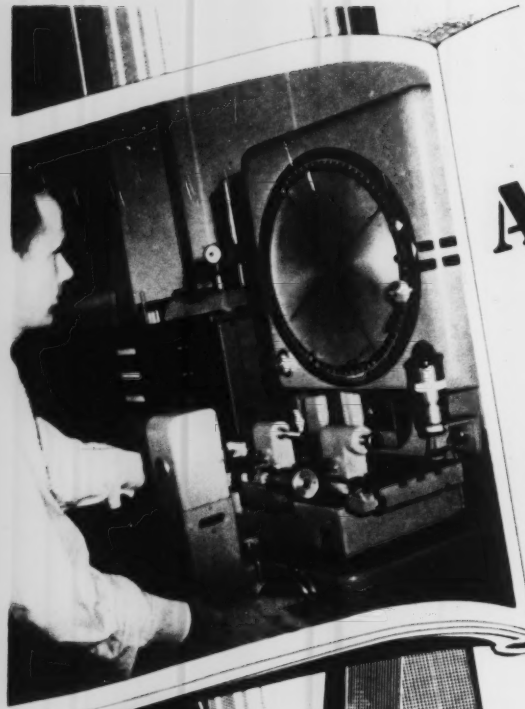
Subsidiaries: ADAMSON UNITED COMPANY, AKRON, OHIO • LOBDELL UNITED COMPANY, WILMINGTON, DELAWARE • STEDMAN FOUNDRY AND MACHINE CO., INC., AURORA, INDIANA

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other Heavy Machinery. Manufacturers of Iron, Nodular Iron and Steel Castings, and Weldments.



THE AMERICAN STORY

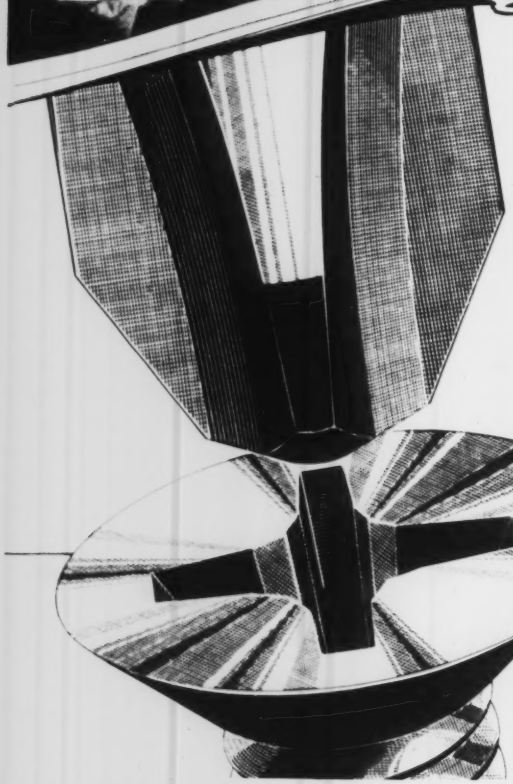
CHAPTER 3:

Self-Criticism

AMERICAN started out 114 years ago as the first screw manufacturer in this country. Since then, most of the major developments in threaded fastenings have been presented under the Eagle trademark . . . including the Phillips Recessed Head Screw.

But in all this time, American has stayed ahead in research and development because of one basic thing . . . *self-criticism*. And that means *constructive* self-criticism. For American was the first to establish an engineering laboratory to put the "Eagle-eye" on its own product as critically as on its competitors.

So when any product goes out under the Eagle trademark, it means that that product is as fine as can be made anywhere in the world today. *Try it and see.*



AMERICAN SCREW COMPANY

PHILLIPS HEADquarters

WILLIMANTIC, CONNECTICUT

Main Office & Plant
Willimantic, Conn.
Office & Plant, Norristown, Pa.
Office & Warehouse, Chicago, Ill.

tinuous wear. Components produced from the standard materials such as cast iron, cast steel, chilled iron or forged steel soon require frequent servicing in the form of repacking and eventual resurfacing or complete replacement.

Slab Shear—A detailed performance record of a chromium plated main ram in a 44-inch slab mill shear, 3000 tons capacity, was given in the Chromium Corp. report. Grinding of the ram was an annual affair, but within the one year period repacking gradually degenerated to a weekly schedule. The ram, 10 feet long and 40 inches in diameter over a 48-inch span, and 24-inch diameter on remaining 6 feet, was chromium plated and installed in July 1948.

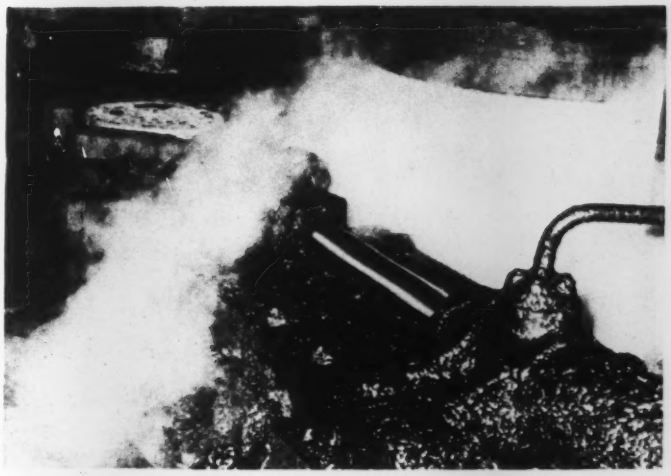
In the four ensuing years the ram was repacked four times on the 40-inch diameter and twice on the 24-inch diameter. Once, within a year of installation, a cold slab overloaded the shear, caused cocking of the ram and galled the chromium surface on one side. A local repair in the form of polishing, spot welding and plating was performed on location without removing the ram from the cylinder. In June of this year, a spare ram was installed and the original ram is now being replated for later use.

Repair—Damage to a chromium plated surface does not necessarily mean a major shutdown or complete replacement of the parts. In many cases, field repairs can be effected in a 24 to 48 hour period.

Hydraulics—Crane axles and hydraulic equipment present good possibilities for maintenance cost reduction. Other uses include web rolls, guide rolls, toe pads and roll necks. Preliminary trials indicate successful application of chromium to roll necks for use in fabric bearings with water lubrication.

Forging plants have benefited from chromium plating. Principal reason, again, is the unique value which chromium plating has in the field of applied hydraulics. Many applications have been made, from valve parts to main actuating cylinders and rams.

One important application involved the plating of the main cylinder of a 10,000-ton forging press. Cylinder was a steel casting that weighed 30 tons with a bore of 6 inches. Since the ram carries the packing, the cylinder wall is the important bearing surface in this case.



Chromium plating is used on cylinder and piston rod of centering device for a press to form hot billets. Object: Whip corrosion and wear due to water and scale

Saves Packing — The leather packing rings used in this cylinder cost approximately $135.00 each. Before the cylinder was chromium plated, replacement every three to six weeks was considered necessary. After plating repacking was reduced to a quarterly operation which could be correlated with other major repairs.

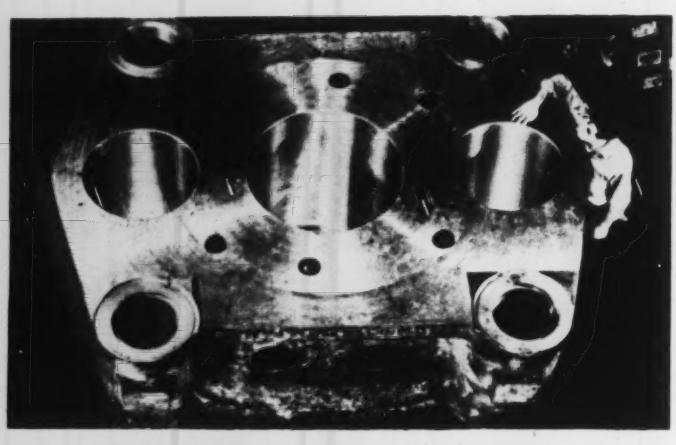
Tin Lines — Chromium plating assists in controlling quality of the product finish from electrolytic tin lines. Starting with the cold reduction mills, the pull rolls and tension and coiler rolls are good applications. Here the hard chromium surface, properly finished, is capable of resistance to scuffing, scratching, and mars which in turn, mark the sheet and reduce the quality of surface finish. The roller levelers, including pinch rolls, are also successfully chromium plated.

Tubes—In welded tube production, skelp forming rolls, particularly for high quality light gage tubing, give less scuffing or marring of surface and increase production when chromium plated. Turning again to hydraulic equipment, the pipe expansion and sizing units and the tube testing units benefit from chromium plating.

At Bethlehem—Chromium is being used on cylinders of pitch pumps at the Lackawanna plant of Bethlehem Steel Co. Service life of these pumps handling high temperature molten pitch containing sulphur was improved by chromium plating the cylinder sleeves and stellite coating the cast iron pistons.

Another application at Bethlehem is crane wheel axles in open hearth cranes to combat severe abrasive conditions. Regular axles have a life of about four months in this area and require two sets of bronze bearings during this time. Chromium plated axles were still in service after 35 months, and the bearing life has been extended to more than a year.

Maintenance Tool — Chromium plating has proved itself a maintenance tool by the economies that develop consequent to its use. According to Dr. R. M. Wick, Bethlehem engineer, the increase in service life of a machine member before wear reaches the tolerance limit, and the decreased wear obtained on the mating member, are primary factors in reducing cost. The corrosion resistance imparted by chromium plating sometimes results in a lower initial cost for chromium plated steel than for



When packings are not easily accessible chromium plating on actuator cylinders has especially paid off. Bores of this 200-ton coning press are plated to 0.020-inch diameter. Block is a 60,000-pound steel casting

special alloys otherwise required.

Saves Packing — Bethlehem experience has been that machine parts operating in packing glands are benefited by chromium plating in several ways: 1. Extension of the useful life of the packing material in some cases has given sufficient savings in material cost to more than pay for cost of the chromium plating; 2. extension of time interval between maintenance adjustments has reduced machine downtime with benefit to production; 3. consequent reduction in maintenance man-hours required is a readily computed direct cost saving.

A service test of over five years duration (68 months) was made with a chromium plated ram on a 500-ton forging press. When it was removed from continuous service for use as a spare, it was in fairly good condition and still giving satisfactory service. According to the report on this test, as given in the *Iron and Steel Engineer*, the 2093 days of service for the chromium plated ram compares with 474 days which is the best previous record on this press for the usual cast iron ram.

The records on the cast iron rams showed an average requirement of $2^1/_4$ packings per month, or 153 packings in a 68-month period, which compares to the 25 packings actually used during the test with the chromium plated ram. The 128 leathers saved represent a total reduction of $2688 in the cost of packings alone during the test period.

Salvage — The rectification of mis-machining errors from whatever cause is a service rendered by chromium plating applicable both to maintenance and to production.

Here's How — The conventional chromium plating bath which is extensively applied in decorative plating is also used for engineering plating. This bath contains chromic acid (250 to 400 g/l) and sulphate radical (SO_4) to maintain a ratio of chromic acid (CrO_3) to SO_4 of 100 to 1. This process in practice uses a current density of from 70 to 450 amp/sq ft, at temperatures from 100° to 140° F, with an average plating current efficiency of around 12 per cent.

The plating time at 12 per cent efficiency for each 0.001-inch thickness of chromium varies from about 6 hours at 70 amp/sq ft to 45-60 minutes at 450 amp/sq ft.

Puts It On Faster—Because of the drawback of low plating speeds, Bethlehem's Dr. Wick has developed a high speed chromium plating process operable at high current densities, of the order of 1000 to 3000 amp/sq ft. The plating current efficiency averages about 18 per cent and varies only slightly with current density.

This high-speed process gives plating speeds in regular practice of from 0.0035 to 0.010-inch per hour. Economies result from fewer tanks and their controls, smaller floor space required, improved generator utilization, and proportionately fewer, though heavier, anodes and fixtures.

Mill Uses Water-Base Lube

A water-based solution is being used to cool and lubricate rolling mills forming aluminum, galvanized steel strip, stainless and hot rolled steel in the Hartford, Conn., plant of Wiremold Co.

Using a 4 to 1 solution of water to Lusol for galvanized steel strips in roll-forming machines has prevented seizing of steel in forming rolls and cut down excessive wear at the same time. Lusol is a chemical concentrate that is mixed with water in varying proportions depending upon intended use. Longer runs between roll toolgrinds have been realized.

Circuit Breaker Book Published

A manual explaining operating principles of basic circuit breaker designs, and providing engineering data on factors of application is a publication of Heinemann Electric Co., Trenton, N. J.

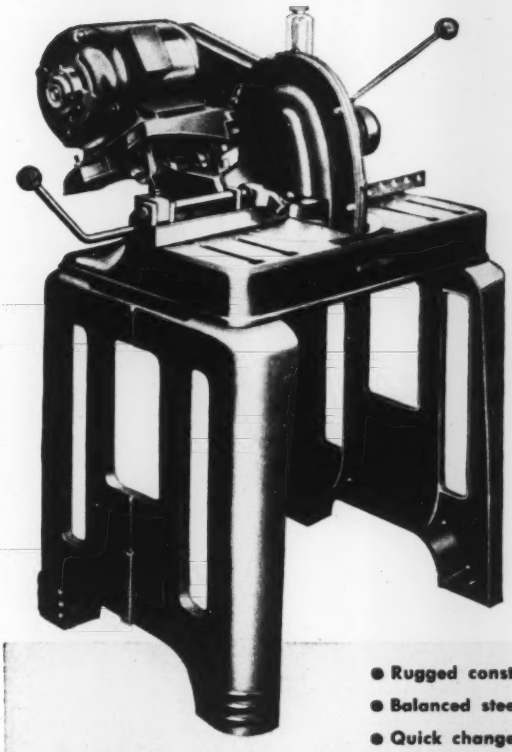
Included in the new manual are simplified diagrams showing the three basic types of circuit breakers in general use today, with brief descriptions. Charts and diagrams are employed to explain temperature factors, inrush current effects, tripping and reset time and time delay curves.

Also covered are questions of quick or slow make-and-break and wire deterioration rates at various ampere values.

Aircraft Motor Parts Described

A bulletin describing Rotomotive equipment for standard and custom aircraft electric motors and electric and hydraulic actuators is available from Jack & Heintz Inc., Cleveland.

Data on product features and performance are given for small high-speed motors, submersible fuel boosters, refueling pump motors and specially designed actuators.



Cut steel, aluminum, copper and brass in one fast, easy motion with a

DELTA

Cut-Off Machine

- **Rugged construction — heavy castings throughout**
- **Balanced steel pulleys**
- **Powerful 3-belt drive**
- **Quick changeover to handle ferrous or non-ferrous materials**
- **Timken roller pivot bearings, double-sealed arbor bearings require no lubrication**

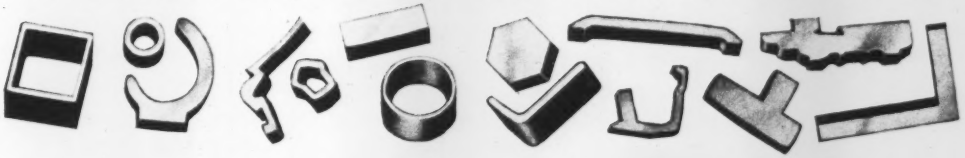
Smooth, clean cuts through steel by the abrasive wheel of the Delta Cut-Off Machine keep burrs to a minimum—frequently eliminates deburring. Easy, effortless cuts through non-ferrous metals leave a "polished smoothness". You see the benefits—speedier production, greatly reduced costs.

This versatile machine has literally hundreds of uses, such as cutting non-ferrous rod and tubing, old drills, mouldings, pipe and conduit, tool steel, steel tubing, rods, and wire rope—operations now being done by manual methods or on far costlier machines. It is also ideal for accurate high-production woodworking cut-off.

It will cut high speed or cold rolled steel bars or sections up to equivalent of $\frac{3}{4}$" solid round stock; and steel tubing up to $1\frac{1}{4}$" diameter with wall thickness of approximately $\frac{3}{32}$". On non-ferrous metals it cuts solid sections up to $1\frac{1}{2}$" diameter; tubular sections up to 2" diameter.

Maintenance costs are negligible.

Numerous shapes and materials can be cut off



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There's a Delta Power Tool for Your Job-

WOOD OR METAL WORKING

53 MACHINES • 246 MODELS • MORE THAN 1300 ACCESSORIES

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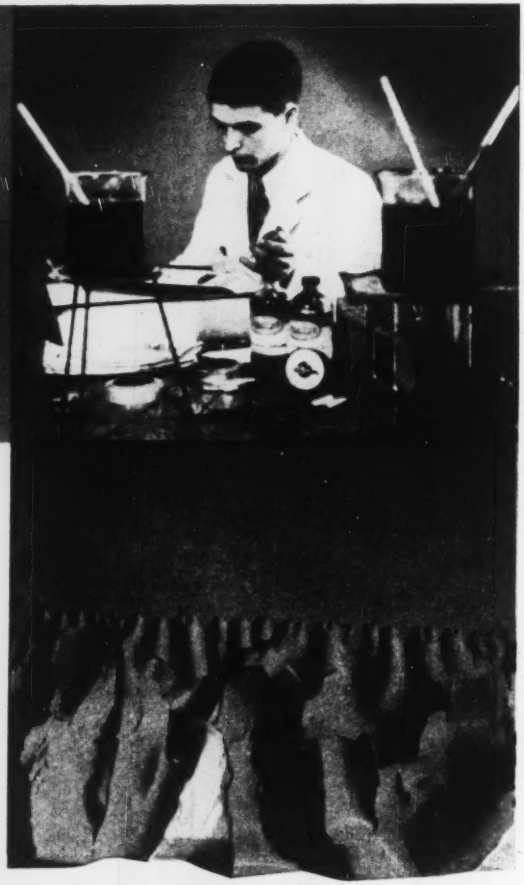
ENTHONE ENAMEL STRIPPERS



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to fill your particular needs . . .

If you have trouble finding the right stripper to remove the coating on your work, Enthone will be glad to select the right one from the many they make or will formulate a new one that will meet your requirements.

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Enthone Research Chemists have developed over a score of strippers for organic finishes and are constantly seeking better methods.

Write for Enthone check list on over sixty products and processes for better electroplating and metal finishing.

METAL FINISHING PROCESSES

ENTHONE

ELECTROPLATING CHEMICALS

442 ELM STREET
NEW HAVEN, CONNECTICUT

New Model

(*Continued from p. 54*)

gave Dodge a better opportunity to conduct a dress rehearsal on its new models than is usually the case, and it, along with other Chrysler divisions (see STEEL, Oct. 27, p. 57), was able to get its 1953 model in production for a brief period and work out the tooling bugs while the steel strike was keeping 1952 models from being produced.

It is only once in a blue moon that the assembly line and all the feeder subassembly lines undergo a complete overhauling. This, however, was necessary for the new car because of the complete departure from previous models. Thus, in addition to the normal retooling, such items as the bed plates on the assembly trucks used to carry bodies along the line had to be rebuilt for the new product. Conveyor arrangements were also extensively altered. The decision of Dodge to make every body style it offered, whereas formerly, the low volume convertible and station wagon styles had been purchased, also had to be considered in the tool-up.

Die making and tooling were now in progress. Detail drawings of many of the parts and mechanisms were being distributed to the purchasing department for ordering. Such things as the hinge swing of the doors had been settled on at a very early stage of the design period because this would have a decided effect on styling and on basic tooling. But some leeway was permissible on such things as trim and ornamentation until fairly late in the game. Some of the standardized items which required relatively short set-up times for the suppliers could be ordered as late as eight weeks ahead of the production date. Seat cushion springs, for example, were not released until June, 1952—no problem on this kind of thing.

Glass, however, was another matter. The single piece wrap-around rear window almost didn't appear on the new model. As late as April the word was that a segmented glass would have to be used. At virtually the last minute the supplier consented to make this extremely tricky one-piece window. An unwritten law in the organization which prohibits any design change within six months of the introduction date, therefore, was not broken.

Role of Purchasing

Purchasing and production control departments' role in new model production cannot be over-emphasized. Besides lining up supply sources they set up dates for vendors to have parts start coming into the plants, and more important than the date for arrival of the first parts were the schedules it established from then on. No automaking plant carries any inventory worth the name, but Dodge, which is utterly devoid of storage space and has one of the most complex and largest plants in the industry, must receive its parts on specified dates and even in some cases at specific hours to avoid a receiving dock snarl-up or production stoppage.

Test Car Rolls In

It is necessary to go back in the chronology to when the contour lines of the car were approved to pick up the trail of the test car. Hand-built cars were begun at this point, each sheet metal part being laboriously hammered out over wood forms in the experimental shop, and the entire bodies were assembled by hand. Several of these cars were able to take to the road by the fall of 1951 to get a thorough going-over by the test drivers and some idea of their durability. Concurrently sections of bodies were fabricated of aluminum by hand to give the master mechanic's staff an opportunity to make sure it had correctly analyzed the assembly fixture needs. Much more of this kind of work, of course, had to be done with a completely new body than with one which has had only portions changed.

Eye on the Chassis

Even before the car's complete styling was decided upon, and having significant bearing upon it, the decision was reached to shorten

(*Please turn to p. 118*)

In this shop "program" cars are built by hand before production facilities are available. A door center pillar is formed in the foreground

Easy on the draw

● Shown above is the drawing operation used by The Lock Joint Tube Co. in the production of automobile steering gear jackets. Two ¼-inch draws are made on steel tubing.

Dissatisfied with the performance of a conventional drawing compound on this job, operators took the advice of a Standard Oil lubrication specialist and switched to STANOSTAMP C Compound.

This product has met their needs on every count. It has proved economical to use because operators have been able to mix it with water and soluble oil and apply that mixture in light coatings to the steel tubing. STANOSTAMP C has provided better protection for dies, thus reducing wear. Draws are now made on over 2,000 pieces before dies require polishing. Although the drawn pieces are not cleaned until long after the drawing operation, there have been no rusting troubles.

Whatever your problem or need, you'll find, as did this midwest company, that a Standard Oil lubrication specialist can help you. He has a complete line of high quality cutting oils to offer and the training and practical experience to apply them most effectively. You can get his help quickly and easily by phoning your local Standard Oil Company (Indiana) office. Or write: Standard Oil Company, 910 S. Michigan Ave., Chicago 80, Ill.

What's YOUR problem?

Russ Jenkins (left), lubrication specialist in Standard Oil's South Bend office, helped the superintendent of this midwest plant improve a drawing operation through the use of a STANOSTAMP Compound.

Mr. Jenkins is one of a corps of able lubrication specialists who are located in Standard offices throughout the Midwest. These men have been specially trained in Standard Oil Lubrication Engineering Schools and, in addition, have a wealth of on-the-job experience. The specialist nearest your plant is ready to give prompt, expert, and thorough attention to your lubrication problems.

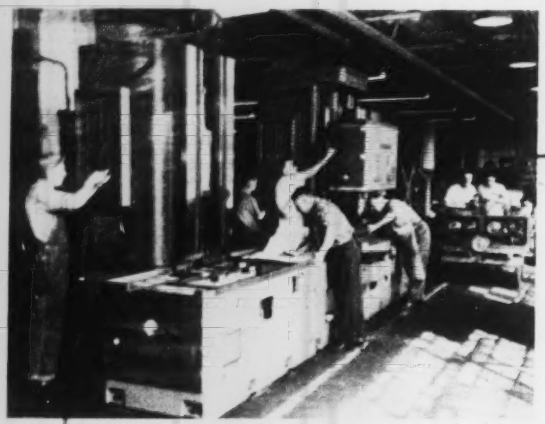
It's easy to obtain his services. A phone call to your nearest Standard Oil Company office will bring him quickly to your plant . . . with no obligation to you, of course.

Spells "finish" for another cutting problem. A midwest manufacturer wanted better finish on steel valve seats. STANICUT Cutting Oil 117 BCS replaced a more expensive product on this screw machine job and produced the desired finish. It also extended tool life, resulting in lower tool cost and fewer tool changes.

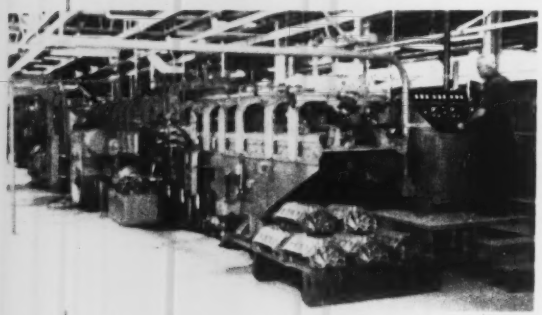
Solution for a hard water problem. SUPERLA Soluble Oil has helped the U. S. Machine Corporation, Lebanon, Indiana, overcome a hard water problem. Mixed with the hard water used in the plant, SUPERLA Soluble Oil has given excellent results on jobs calling for the machining of cast iron. There has been no spoilage of the work due to rusting. Tool life has been highly satisfactory. Clean operation and freedom from odor development have provided desirable working conditions for machine operators.

STANDARD

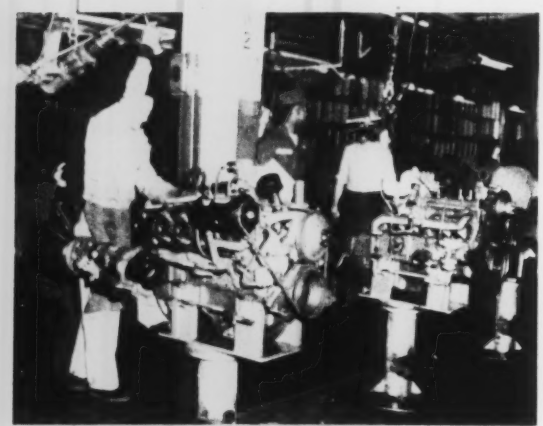
STANDARD OIL COMPANY
(INDIANA)



Dodge and Chrysler tool shops were humming as the new machine tools began to take shape. This Dodge-built Cincinnati machines the cylinder head's combustion chamber



Largest of machine tools Dodge built is this Cincinnati-designed tunnel broach, used on cylinder blocks. This early picture shows only a small float of cylinder blocks



V-8 and six-cylinder engines are assembled at the Dodge main plant on these pedestal-type conveyor fixtures which let production workers get to all sides of the engine

(*Continued from p.* 115)

the wheelbase of the new car. To get an improved ride and better stability the chassis engineers made a number of changes, the spring relocation, for one thing, having a definite tie-in with the placement of the passenger compartment.

High in the chassis group's mind at this stage was making provision for the V-8 engine, although this at the time had not been given a model-year date. Engine compartment design, therefore, was predicated on this unit.

The corporation's chassis engineers, who are responsible for suspension, frame, engine and transmission, had released the V-8 for production about two and a half years ago. DeSoto's was ready at the same time. All these engines lacked was the tools to build them. The plant layout for the Dodge engine had been readied even before this, and some ideas from it had been incorporated when Chrysler set up its V-8 engine line.

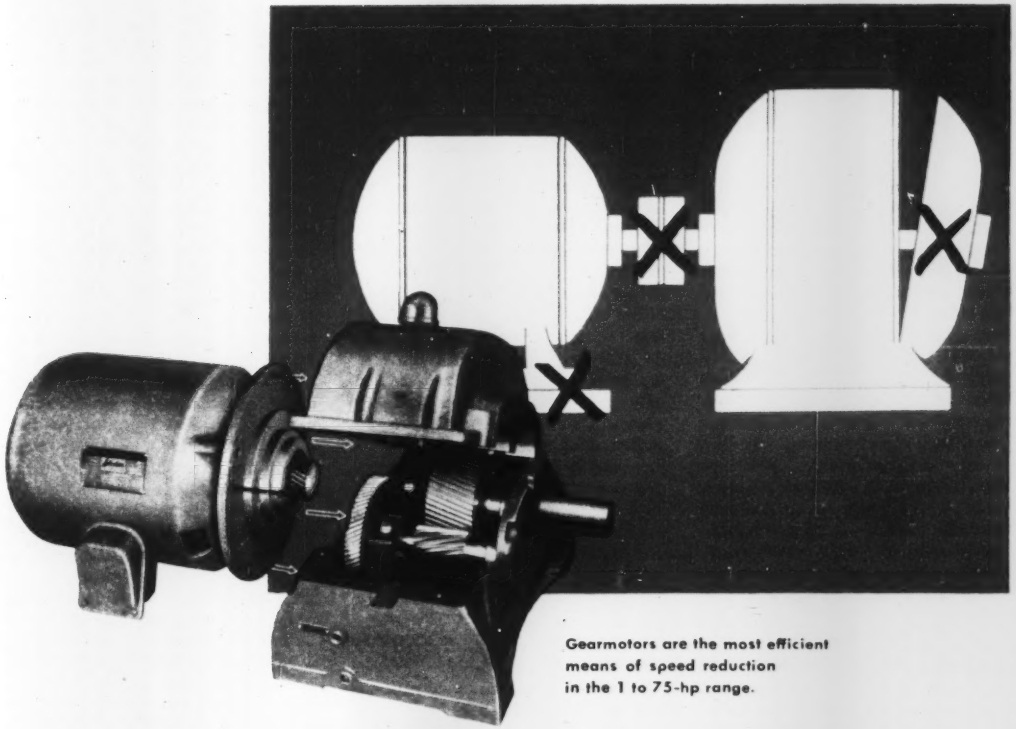
Machine Tools for Engines

To tool up for a completely new engine is the biggest job an automobile company faces. This is true even in normal times, but these days not only is the decision hard to make (it is estimated that tooling for an engine costs upwards of $50 million) but once arrived at there is next the practical problem of getting the necessary tools. Government restrictions on the amount of civilian business the machine tool builders could take caught Dodge's program squarely.

The result was that Dodge went into the machine tool business. It built almost a fourth of the major machine tools it would require to get the engine in production—a fantastic undertaking.

When the Dodge men were told by machine tool builders of the delivery dates on some of the equipment they had to have to make the V-8 economically, the new engine appeared out of the question for years. Dodge was able to get a promise from the machine tool men that they would give every assistance if the automaker attempted to build the tools itself. Spread around in tool

(*Please turn to p.* 120)



Gearmotors are the most efficient means of speed reduction in the 1 to 75-hp range.

Here's why *Life-Line* GEARMOTORS stay on the job longer

LESS TIME OUT FOR SERVICING MOTOR

Removing the motor from a Life-Line gearmotor takes but a few minutes. Remove the motor mounting bolts and you are on your way—and, reassembly is just as simple and fast. Install the mounting bolts and the job's complete. No realigning of shafts—no coupling to adjust—no mounting feet to shim.

Should you be "on the spot" where down time is critical, this means that your spare motor can be quickly and easily installed. At the most, it is a simple assembly of the adapter bracket.

LESS TIME OUT FOR SERVICING GEARS

Here again, Life-Line's split case construction pays off. Simply by removing the top half of the gear case, the gears can be inspected or removed without touching the mounting bolts—without draining the oil—without disturbing the connected load.

Ask your Westinghouse representative for the details on how Life-Line gearmotors pay for themselves in production time saved. For descriptive literature, write to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-07515

YOU CAN BE SURE...IF IT'S Westinghouse

Life-Line GEARMOTORS

(Continued from p. 118)

shops throughout the corporation are many of the tools needed for generation of more tools and the Chrysler Corp. had been suggested as a potential subcontractor for machine tools when their shortage was at peak.

By then Dodge knew it wanted the V-8s for '53s and to get them it was going to have to build machine tools. So the engineering of the special purpose tools it wanted was done by the regular machine tool makers and they offered help of other kinds as Dodge got its building program under way. The machine tool companies helped Dodge find suppliers with capacity for its requirements, for one thing.

But the significant thing is that Dodge launched into a program completely foreign to it and successfully built some of the largest and most complicated transfer machines in use in the industry today. The biggest of these is a tunnel broach to Cincinnati Milling Machine's specifications. Weighing 225 tons and measuring 159 feet in length, this machine is used on the V-cylinder block to broach the top and bottom surfaces. Broaching has long been a Dodge specialty and it is said that Horace Dodge was the first man in the automotive industry to use this machining method. Work on the tunnel broach began last January. It was completed four months later.

To make way for the V-8 engines the entire six-cylinder manufacturing operation at Dodge Main had to be moved out, this relocation to the Nine Mile Press Plant beginning last December and being conducted so that no production was lost while it went on. The cleared space was used as the assembly area at point of use for the Dodge-built machines as their components funneled in from various tool shops.

Fourteen additional transfer-type machines were built during the early months of this year. Among these were a sizable Baker drill unit and another Cincinnati which is used for machining the combustion chamber.

Dodge wouldn't want to be called on to make more machine tools, the operation was extremely costly to it, some indication being offered by the price tag of $450,000 on the tunnel broach. But the experience is proving valuable to it now because its electricians who did the original wiring are much better able to maintain the machines, and others who worked on their construction are familiar with them for repairs.

Production Going

The V-8 production line as now running still has a few holes in it where missing pieces of vendor-supplied equipment will be added over the next few months. Equipment for a second production line is on order, this one to be completely vendor-built, and will be installed in February to give Dodge a production potential of 2400 V-8s a day on a two-shift operation.

When all the equipment is set up 25 transfer machines will be used for making the cylinder block. In all, for this operation, 34 machines will be employed with a total of 1419 spindles for drill-

how the MAY-FRAN CHIP-TOTE works for INDUSTRY

AUTOMATIC SCRAP REMOVAL STEPS-UP PRODUCTION

CHIP-TOTES can remove borings, turnings and chips from practically all high-production machine tools while they are operating. These time-saving conveyor units are assembled from stocked component parts to meet specific requirements of each application. Their design permits flexibility of installation according to type of machine tool, type of metal scrap, rate of removal, coolant flow, available space, etc.

CHIP-TOTES employ patented MAY-FRAN hinged-steel belting, which features interlocking side-wing design to prevent chip fall-through and assure continuous trouble-free operation. Perforated links can be furnished to permit drainage of coolant from chips.

ing, reaming and tapping. The cylinder head line will have 13 machines, 917 spindles, and the clutch housing machining setup will consist of 14 machines and 276 spindles. Crankshaft, clutch housing and water pump housing production lines are also transfer-machine equipped.

For assembly of the new engines and the sixes, whose parts are brought to Dodge Main, a completely new installation was made, consisting of pedestal-type fixtures moving flush with the floor to permit the assemblers to get around the engines as they work. Overhead conveying type of assembly fixtures were decided against in Dodge's case because the engines are used at this plant after testing and few are shipped. The testing setup, too, is completely new. Sixty dynamometer test stands are used to give each engine a 20-minute "hot" run before being installed in the cars.

Fewer Foundry Changes

Dodge Foundry's renovation and preparation for the new V-8 was not as extensive as that of the engine line, but was, nevertheless substantial. A new conveyor was installed on the pouring floor, a new exhaust system at the shakeout. Automatic sand slingers were put in for cope and drag work, and soon to be added are automatic core blowers for water jacket cores. Most unique innovation in Dodge's foundry, however, is its casting of two v-blocks in the same mold with a common sprue.

L. L. Colbert, president of Chysler Corp., has used the figure of over $200 million as the sum of the costs of designing, tooling and equipping its entire "F" series cars. Dodge takes the lion's share, probably over $100 million, because of its new engine. A car is born with considerable pain, and the obstetrician's bill also hurts plenty.

Device Measures Static Charge

An instrument that detects and measures electrostatic charges is a recent development of Baldwin Instrument Co. Ltd., Dartford, Kent, England. Agents in this country are Herman H. Sticht Co. Inc., New York.

In operation, the pistol-shaped instrument is pointed towards the object which is suspected of carrying electrostatic charges. Voltage gradient is read directly on the instrument dial, which has a scale of 0-2000 v per foot. An adjustable sleeve on the instrument is calibrated to give readings 1, 10 and 100 times the scale reading.

More Grinding Data Available

Important data on grinding, of value to both engineers and production management, are increasingly available as a result of basic research conducted at Mellon Institute, Pittsburgh. Sponsor is the Grinding Wheel Institute.

Current experiments are conducted to study residual stresses of surfaces that are being ground. Future studies will include methods of alleviating grinding stresses to determine their effect upon service life.

The CHIP-TOTE has eliminated both machine down-time for scrap removal and manual scrap handling at the General Electric plant in Erie, Pa.

In this installation, brass chips from automatic lathe are funneled onto CHIP-TOTE's hinged-steel belt while lathe is operating. They are carried horizontally until clear of machine's mechanism and then up an incline for discharge into tote boxes. The CHIP-TOTE is synchronized with lathe's metal removing capacity to assure continuous jam-free chip removal. For maximum safety of operation, the chip conveyor is equipped with an adjustable clutch that disengages if pre-set load limit is exceeded.

Write today for the new CHIP-TOTE catalog.

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ENGINEERING INCORPORATED

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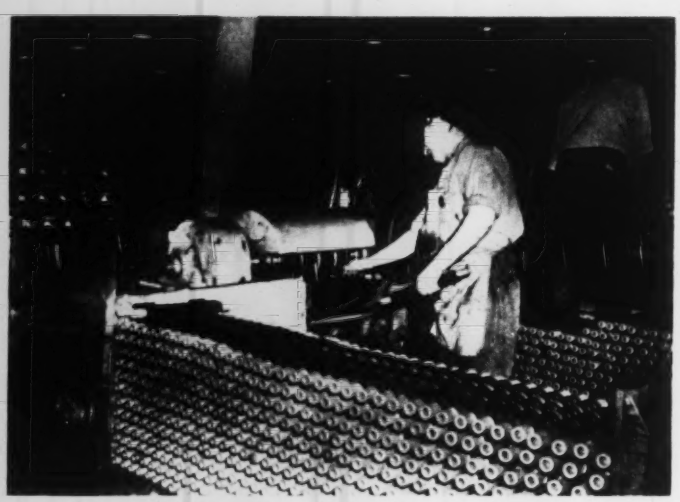


Molded track pins are fed into the brushing machine one at a time. Wire brushes mesh with each of the six sections where flash and film are to be removed. The six areas are cleaned thoroughly in only a few seconds and the pin discharged

Power Brushing Versatility Expands

Specially-engineered setups continue to offer savings on multiple brushing jobs, but the technique is expanding to include standardized assemblies for many purposes

POWER BRUSHING, applied on special production jobs or through a newer approach that calls for standardized setups, continues to offer opportunities for time and material saving.

In one engineered production operation, the complex problem of removing rubber flash and film from tank track pins was solved with considerable speedup by use of brushing techniques. In addition, the job done by brushing results in salvage and return to use of much material formerly wasted.

The problem presented to brushing specialists at Osborn Mfg. Co., Cleveland, required removal of rubber and flash and film from six bearing and electrical ground sections of track after molding. Removal was necessary to assure good electrical contact for static elimination.

Special Machine—After a thorough examination of job conditions, Osborn designed a special machine, constructed to remove excess rubber from all six areas simultaneously in a few seconds.

Six 0.014-inch wire brushes are mounted and spaced so all the operator need do is feed the track pin into position. The pin is revolved in a counter direction to the rotation of the brushes, then dropped out of position automatically as the next pin is fed into the machine.

No Specific Rules—According to Osborn, experience dictates that production brush applications must be engineered. There are no specific rules that can be set up to cover the varying conditions met by brushes when used as production tools. Thus, each job must be studied by someone familiar with brushing techniques, wheel construction, effect of brushing speed, wheel size and manner of presenting work to the wheel.

On the job above, cleanup is complete. No other work need be done to expose the bare metal for perfect electrical contact. Excess rubber is salvaged easily because it was brushed off, remaining clean and free from abrasive grit or other foreign matter.

Standardized Brushes Too—The company also reports progress in its program for developing brush assemblies that can fit easily into brush-using machines having many applications in industry. In maintenance, one example of this newer concept is the unit designed for cleaning conveyor belts.

Industry practice calls for periodic belt shutdowns during which the belt is cleaned by hand. This involves costly downtime and special maintenance work because considerable waste material builds up on the belt. Another disadvantage is seen from the fact that buildup of residue cuts down operating efficiency by wearing on the belt or transfers to the return rolls where it acts as an abrasive.

Complete Assembly—Osborn has long offered a brushing setup that cleans conveyors continuously without shutdowns for hand cleaning. However, a formidable restriction in many plants was found to be lack of experience or equipment to build adequate brush-driving and necessary supporting equipment.

To remedy the problem, the firm designed an assembly that does the entire job, insuring proper operation of the brush. The cleaner consists of a special 12-inch diameter brush mounted in suitable bearing and coupled to a gear head motor. The motor is built on a channel base with an opening under the brush so material cleaned from the conveyor can be carried away for reclamation. Special guards guide the brushed off material into the channels.

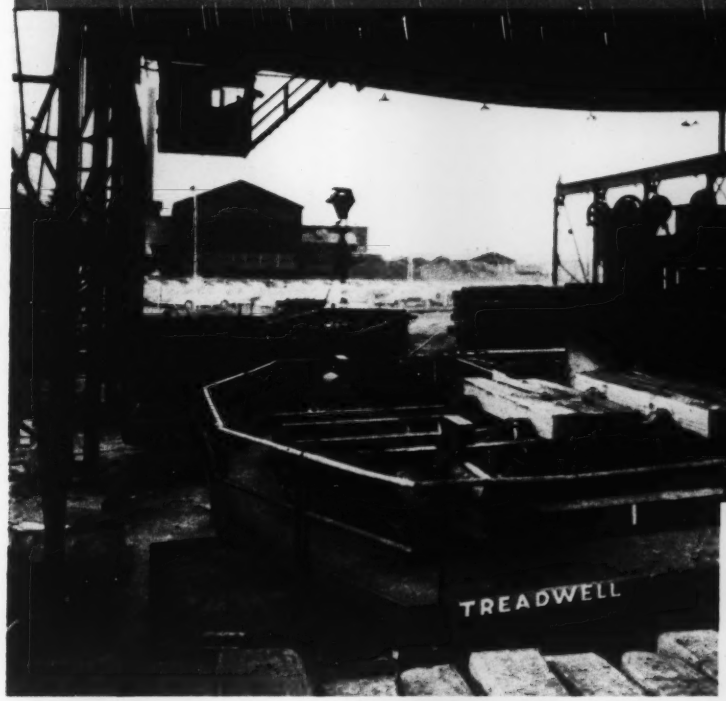
The motordrive can be coupled into the belt drive so brush and belt stop simultaneously. With such a unit, the user has only to fasten it into place, with proper adjustment, then plug it into a power source.

Side-Positioners Described

Application and operation of side-positioning regulating controls are described in a booklet available from Westinghouse Electric Corp., Pittsburgh. When these photoelectric controls are applied to a web of material, they serve to maintain the traverse position with relation to the processing machine.

Copies of DB 18-530 are available free.

Treadwell



FURNACE CHARGING MACHINE

The illustration is operating on what is probably one of the largest re-heating furnaces in operation, heating blooms up to 16" x 16" x 16' long with a furnace hearth length and charging space 110' long.

Manipulators, Mill, etc.
Mills, Blooming & Billet
Mills, Merchant & Bar
Mills, Rod
Mills, Sheet
Mills, Strip (Cold)
Mills, Strip (Hot) & Skelp
Mills, Vertical Edging
Tables, Mill
Tables, Tilting & Lift
Tables, Transfer
Transfers

Coilers & Reels
Conveyors, Coil
Drives
Ejectors, Furnace
Gauges, Shear, Saw, etc.

Beds, Cooling
Beds, Inspection
Bumpers, Furnace

Pushers, Furnace
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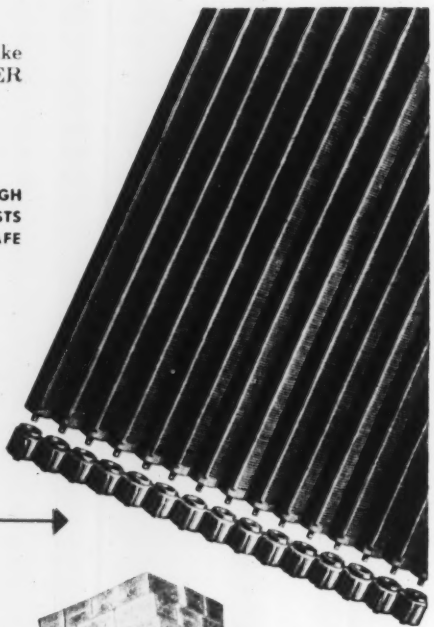

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TVA Pump-Turbine Started

Allis-Chalmers gets the award to build the huge Hiwassee dam power system

CONTRACTS for a huge electric motor and reversible pump-turbine, the heart of a pump-storage project for TVA's Hiwassee dam in North Carolina, have been awarded to Allis-Chalmers Mfg. Co. Completion is scheduled for late 1953.

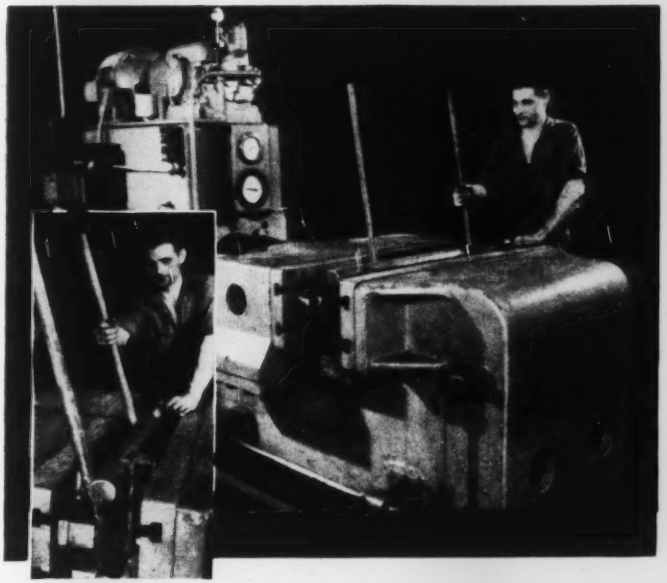
In this installation, a single hydraulic machine will operate in one direction as a turbine, in the reverse direction as a pump. A direct-connected electrical machine will serve as a motor for pump operation and as a generator for turbine operation.

Peak Demand Safeguard—Water from Hiwassee reservoir, driving the unit as a turbine-generator, will add needed energy to the TVA system in peak demand periods. During slack periods, when surplus power is available from other plants, the unit will operate as a motor driven pump to lift water back into the reservoir. Thus, it will serve as a huge energy storage battery.

According to A-C's General Machinery Division, Milwaukee, the pump-turbine will utilize the largest Francis-type runner ever built. As a turbine, it will have a maximum 120,000-hp rating; motor driven, its pumping capacity will be 3.3 billion gallons of water per day. By comparison, the pump will have more than three times the capacity of each of those serving the Grand Coulee irrigation project.

Imposing Specifications—Equally imposing are specifications for the electrical motor-generator. As a motor, it will rate 102,000 hp, 106 rpm. This is about 50 per cent larger than the units driving the Grand Coulee pumps, reports the company. Its generator rating is claimed to be 70,000 kva, 13,000 v.

In a normal operating cycle, the pump will begin lifting water from Apalachia lake into Hiwassee lake under a head of 135 feet at 5200 cu ft per second. By the time the upper reservoir is filled, the head will be 3900 cu ft per second against a 205-foot head.



Mercury Mfg. Co. does a better job twice as fast with a

FARQUHAR Hydraulic Press

Mercury Manufacturing Co., Chicago, Ill., producers of fork trucks, tractors and trailers, uses a 200-Ton Farquhar Horizontal Bulldozer press to make forgings and stampings and to form plates. In operation 8 hours a day, the press does most jobs twice as fast as the mechanical bulldozer used formerly, and better speed control produces better work.

In addition, many pieces of work that used to be farmed out are now done at Mercury providing better production and quality control, and effecting additional savings of time.

In the operation shown above, high carbon brazed steel is bent quickly and accurately. In other operations, the press forms heads on bolts, legs for caster forms, and bends structural T frames.

Mercury reports very small maintenance costs, and sums up the company's satisfaction with, "It's the best!"

Farquhar Presses Cut Your Costs

Just one more example of cost-cutting Farquhar performance in heavy production! Farquhar Presses are built for the job . . . assure faster production due to rapid advance and return of the ram . . . greater accuracy because of the extra guides on moving platen . . . easy, smooth operation with finger-tip controls . . . longer life due to positive control of speed and pressure on the die . . . long, dependable service with minimum maintenance cost!

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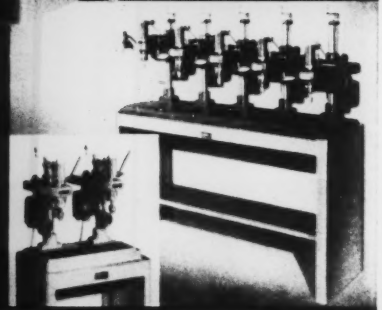

Multiple spindle units for close tolerance, high production requirements.

THE *Hamilton* TOOL COMPANY
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Plant Size Doubled

This new section of the Wendt-Sonis Co. plant is organized to provide best use of original equipment and new machines for work on special and standard carbide cutting tools. Plant addition doubles manufacturing area at the firm's works in Hannibal, Mo.

Device Reclaims Army Shells

Purchased for the Army's dollar-saving program of reclaiming old ammunition of 40, 75, 76, and 90-mm calibers are eight General Electric mouth-annealing installations. Each unit consists of a 30-kw, 10,000-cycle motor-generator set with controls, and 2 two-position induction annealing machines that can handle 600 cartridges per hour.

Purpose of the program is to reload shells that have become unreliable because of age. Mouths of the brass casings are softened to insure a snug fit when the cartridge cases are refilled and again crimped on the projectile.

Book Covers Fuel Analysis

"Spectrographic Analysis of Diesel Engine Lubricating Oil" published by American Locomotive Co., Schenectady, N. Y., tells in 78 pages of text and photographs how the spectrograph is used by diesel locomotive engineers to control engine maintenance and prevent costly breakdowns.

Book is made up of edited transcriptions of technical papers given last spring at a symposium attended by 86 representatives of 43 railroads in all parts of the U. S. and Canada.

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3 BLAST FURNACE PRACTICE —has been hailed as one of the best books published on the subject in the past 25 years. Its eleven informative chapters include Operating Theories, Thermal Requirements of Shaft, Hearth and Bosh Reactions, Comparison of Operating Data, Raw Materials Problem, etc. Currently selling at $1—yours free of extra cost.

4 CMP SYMBOLS . . . What They Mean —Do you know the latest CMP Symbols and what they mean? What is B-5? Z-2? E-6? V-9? What program is involved when an AS rating is specified? This is the latest checklist.

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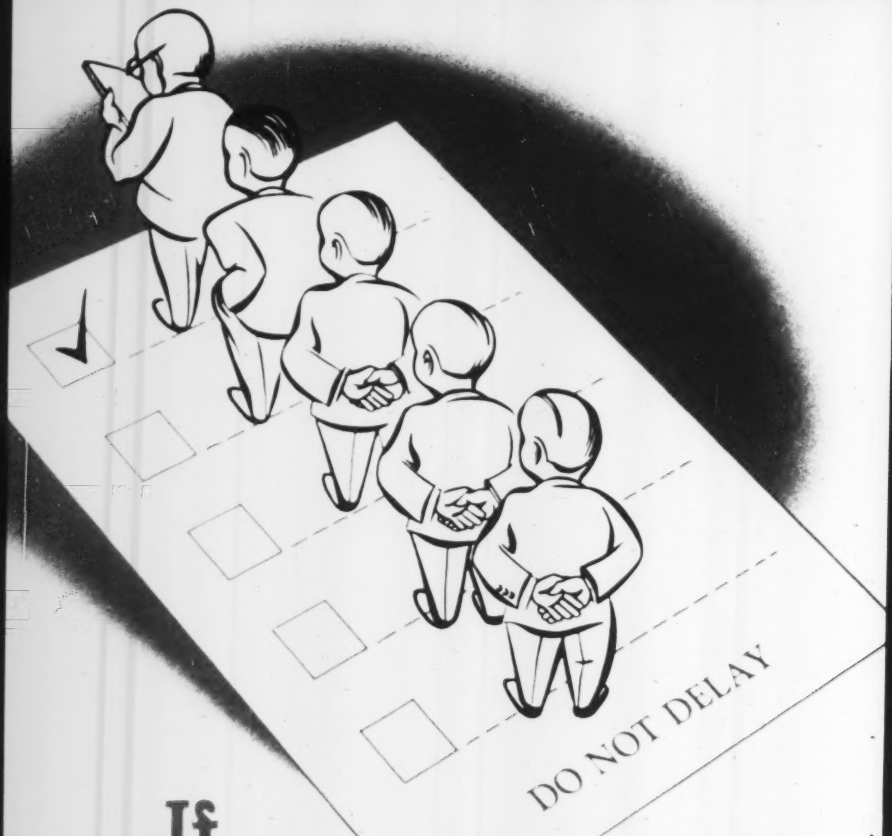

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Life Was Too Short

Computors snap off solutions that took a lifetime, but they can't think creatively

MATHEMATICAL machines are solving problems that engineers and scientists formerly abandoned because life is too short.

Arvid E. Roach, General Motors Research Laboratories, made this summary of the effect wrought by modern devices such as analogue and digital computors when he addressed the Wisconsin Mathematics Council in Milwaukee recently. According to Mr. Roach, an entirely new dimension in scientific and engineering research has been opened.

Time Factor—Citing one example, the research expert related how he and a colleague undertook solution of a problem that had been under experimental study in the GM lab for more than 15 years. With desk-type calculators they worked 2 months just to compute enough data to determine that they were on the right track. A complete solution would have taken 3 years with desk calculators operating 8 hours a day, 5 days a week.

Turned over to men working on high-speed computors, the messy problem could be run off in a few days once it was set up and programmed, says Mr. Roach. He adds that countless other significant problems must have been carried up to the point of imminent solution, then dropped for lack of time. The computing machine erases the time factor.

Three Principal Virtues — Mr. Roach emphasizes that a computor is incapable of solving any problem that cannot already be solved by hand methods. "It does not by any means replace the live mathematician who must decide how the problem is to be solved and who must prepare proper instructions for the machine to follow," he said.

The computor's virtues, according to the speaker, are simply three: It is quick, it doesn't tire, it does not make mistakes. These, he says, are important, but they fall considerably short of the "Sunday supplement" machines that are alleged to think in a creative sense.

Wrench Is Good In Tight Spots

Removing and replacing a 1¼-inch union fitting in a hard-to-get-at location at Kaiser Steel Corp. is an easy job with a TAC open end ratchet wrench developed by Tubing Appliance Co., Los Angeles.

The application is on the hydraulic system controlling the operation of the coil car in the temper mill. Servicemen can now slip the wrench head and socket over the tubing and up onto the union fitting where it is speedily ratcheted on or off with only a 7-degree arc wrenching area.

Plastic Film Solution Holder

Plastic pipe and fittings are used on a new high-speed film strip processing unit built by Raytheon Mfg. Co., Waltham, Mass.

Advantages of plastic piping, as cited by company officials, are its corrosion resistance, easy installation and relative low cost. Carlon Products Corp., Cleveland, supplied the plastic piping.

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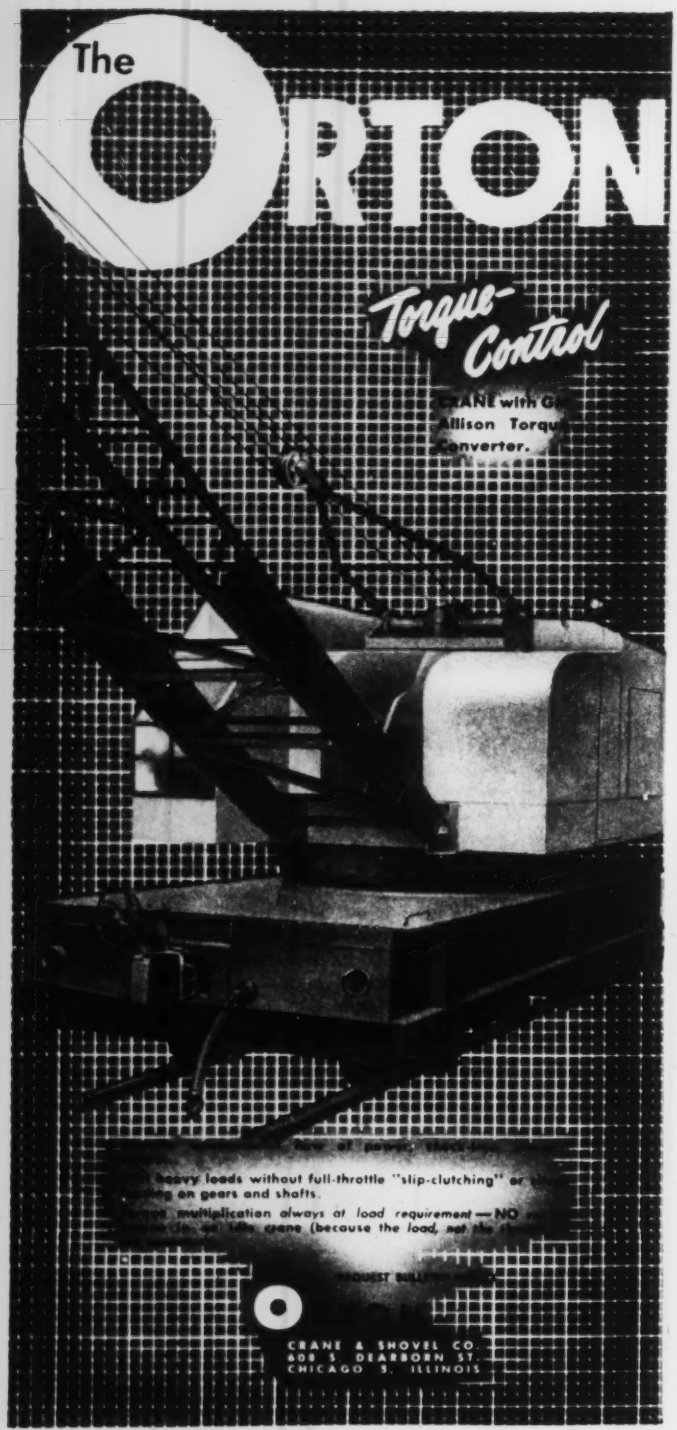


CALENDAR
OF MEETINGS

November 30-December 5, American Society of Mechanical Engineers: Annual meeting. Statler and McAlpin Hotels, New York. Society address: 29 W. 39th St., New York 18. Secretary: C. E. Davies.

December 3, Steel Kitchen Cabinet Association: Annual meeting. Hotel Cleveland, Cleveland. Association address: Engineers Bldg., Cleveland 14. Executive Secretary: Arthur J. Tuscany.

December 3, American Iron & Steel Institute: Regional technical meeting. Thomas Jefferson Hotel, Birmingham, Ala. Institute address: 350 Fifth Ave., New York 1. Meeting director: Frank Ragland.

December 3-5, American Leather Belting Association: Fall meeting. Hotel Commodore, New York. Association address: 320 Broadway, New York 7. Secretary: E. R. Rath.

December 3-5, Society for Experimental Stress Analysis: Annual meeting. Hotel McAlpin, New York. Society address: Box 168, Cambridge, Mass. Secretary: W. M. Murray.

December 4-6, Electric Furnace Steel Committee, American Institute of Mining & Metallurgical Engineers: Annual conference. Hotel William Penn, Pittsburgh. Institute address: 29 W. 39th St., New York 18. Secretary: Edward H. Robie.

December 7-10, American Institute of Chemical Engineers: Annual meeting. Hotels Cleveland and Carter, Cleveland. Institute address: 120 E. 41st St., New York 17. Secretary: Stephen L. Tyler.

December 11, American Iron & Steel Institute: Regional technical meeting. Hotel Warwick, Philadelphia. Institute address: 350 Fifth Ave., New York 1. Meeting director: Frank Ragland.

December 18, Material Handling Institute: Annual meeting. Hotel Statler, New York. Institute address: 731-732 DuPont Circle Bldg., Washington 6. Managing director: R. Kennedy Hanson.

Phillips Granted 85 Patents

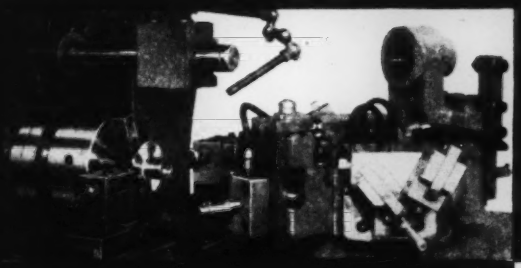
In what is believed to be the largest bloc ever granted to one company at one time, 85 patents in the fields of electronics, mechanical engineering, optics and chemistry were recently granted Phillips Laboratories Inc., New York.

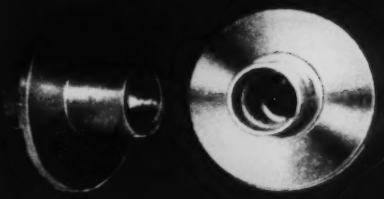
Greatest number of patents were those resulting from the work of Dutch scientists and engineers in Holland and other parts of Europe.

Among patents of interest are some covering stereophonic sound reproduction used in the widely publicized Cinerama. Others deal with movie film projectors, automatic phonographs, a variety of electronic receiving tubes, cathode and x-ray tubes, also high frequency tubes of advanced design such as the traveling wave tube.

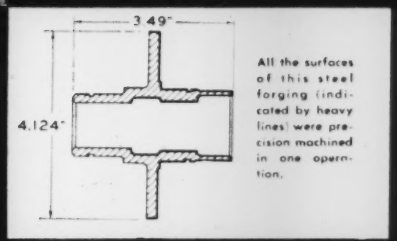
Of special interest in Europe, with its gasoline shortage, are patents relating to the hot-gas engine, which is adapted to operate either as a motor or a refrigerator on any available fuel supply.

Lower UNIT COSTS

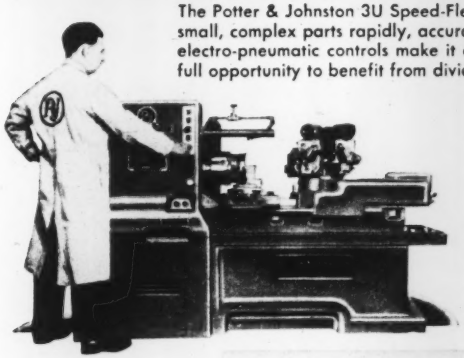




POTTER & JOHNSTON 3U SPEED-FLEX



All the surfaces of this steel forging (indicated by heavy lines) were precision machined in one operation.



The Potter & Johnston 3U Speed-Flex Automatic Turret Lathe is specifically designed to machine small, complex parts rapidly, accurately and economically. Completely automatic operation and electro-pneumatic controls make it easy for one man to handle several machines, affording you full opportunity to benefit from divided labor costs. High spindle speeds and ample power take full advantage of fast-cutting carbide tools. Rugged, rigid, high precision construction assures long life, lasting accuracy and a full return on your investment. Meet today's demand for greater output at lower cost with a Potter & Johnston Automatic Turret Lathe equipped with expert P&J Tooling.

See for yourself how the 3U Speed-Flex can bring new standards of efficiency and economy to your difficult chucking and turning jobs. Send today for your copy of Bulletin 145 that contains complete data, specifications and a pictorial description of the Model 3U and all its advanced engineering features.

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UNITED STATES STEEL

NEW PRODUCTS and equipment

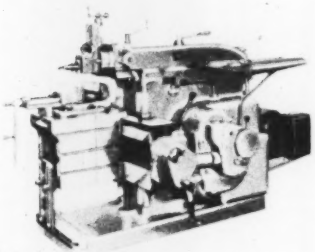
Reply cards on page 145 will bring you more information on any new products and equipment in this issue

Rapid Traverse Crank Shapers

. . . range: 18-36-inch stroke

Capacities of the CMC rapid traverse pattern crank shapers range from 18 to 36-inch stroke. A single lever controls feed, rapid power traverse engagement and direction of table movement, horizontally and vertically.

Power downfeed to head is furnished on these models. Built-in



transmission with heat-treated alloy steel gears has eight speeds to the ram. Pitnam Industrial Products Corp., Dept. ST, 608 Fifth Ave., New York 20, N. Y.

USE REPLY CARD—CIRCLE No. 1

Quick-Acting Fixture Clamp

. . . includes 3 and 6-inch throat

This fixture is built for all milling, drilling, riveting and assembly fixtures. One twist removes trunnion from retaining hook in the mounting bracket. Full open position gives unobstructed vertical clearance for removal of finished work.

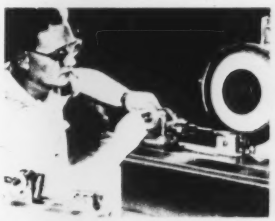
Screw operation and vibration-absorbing spring bearing trunnion insure steady grip in abusive fixture applications. Sizes include 3 and 6-inch throat depths. Centinela Industrial Supply Co., Dept. ST, 11930 Inglewood Ave., Hawthorne, Calif.

USE REPLY CARD—CIRCLE No. 2

Surface Grinder Dividing Head

. . . has three index plates

This surface grinder dividing head is supplied with three index plates, each having six sets of holes, and a bed plate 1 x 3 x 16 inches. Equipment makes application of dividing head possible for

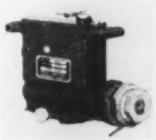


use with surface grinder for producing an infinite number of shapes and parts. Marvin Machine Products Inc., Dept. ST, 416 Ford Bldg., Detroit 26, Mich.

USE REPLY CARD—CIRCLE No. 3

Pressure Switch

. . . operates at -65 to 250° F



Piston type multirange pressure switch will operate satisfactorily between minus 65 to 250° F and its calibrations are not affected by accelerations, shock, vibration or excessive pressure surges. It can be used in warning signals, sequencing circuits, interlocking controls, etc. Bobrick Mfg. Corp., Dept. ST, 1839 Blake Ave., Los Angeles 39, Calif.

USE REPLY CARD—CIRCLE No. 4

Small Tool Protector

. . . forms strippable coat

Dip-Pak plastic coating for small tools is hot-melt, strippable and can be adapted readily for use in

temporary protection during processing, storage and shipping. Material is 100 per cent solids, shipped as plastic briquettes and ready for use after melting in an electric or oil-jacketed pot.

Entire coating operation is completed in a matter of seconds. To remove, coating can be slit with a knife and peeled like a banana. Stripped coating can be reused after remelting. Fidelity Chemical Products Corp., Dept. ST, 470-474 Frelinghuysen Ave., Newark, N. J.

USE REPLY CARD—CIRCLE No. 5

Gang-Operated Disconnect

. . . de-energizes fuses safely

High-voltage motor control fuses are de-energized and made safe and convenient for handling by this gang-operated disconnect method. Fuse compartment has a movable panel on which current-limiting

Series No. 4812 Steelweld Shear. With more than a half century of experience in steel warehousing, Enos & Sanderson know what good shearing is. They are proud of this machine. They advertise that: "Trained shearing teams will give you the finest edge ever cut with this Steelweld"

"NEVER SEEN A *SMOOTHER* OPERATING SHEAR"

Steel Warehouse Elated with Steelweld Shear

For 57 years The Enos & Sanderson Company, Buffalo, N. Y. has been supplying steel sheets and plates to hundreds of Niagara Frontier factories. Recently they installed a Steelweld Shear in their new warehouse. This is used for cutting various thicknesses to 1 4" x 12', as per customer orders. Cuts must be smooth, straight and accurate. Speed is essential to provide best service possible.

Enos & Sanderson's new 35,000 sq. ft. steel warehouse

The following paragraph in an unsolicited letter from Enos & Sanderson indicates how well their Steelweld Shear is serving their needs:

"We are extremely satisfied with the operation of this unit and would recommend this machine highly to anyone. A rigger, who set up this shear for operation, remarked that, in his twenty-five years of work with shears of all types, he had never seen a smoother operating shear in his experience."

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THE CLEVELAND CRANE & ENGINEERING CO.

7835 East 282nd St., Wickliffe, Ohio

STEELWELD PIVOTED BLADE SHEARS

fuses are gang-mounted. Disconnecting blades are behind the panel.

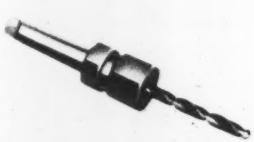
When compartment door is opened, fuse panel is pulled to the front of the compartment automatically. This disconnects the fuse panel from the line and puts the fuses within easy reach. Effect is to permit operator to remove and to replace fuses safely and easily without a hook stick. Electric Machinery Mfg. Co., Dept. ST, Minneapolis 13, Minn.

USE REPLY CARD—CIRCLE No. 6

Stub Drill Chuck

. . . for multiple spindle heads

Stub drill chuck made for use in multiple-spindle heads, is said to reduce costs in drilling bolt or clearance holes. Supported in rigid spindles, chucks project a minimum distance and use short drills so bushings and bushing plates are not required.

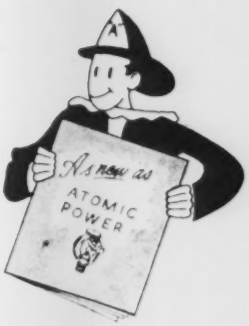


U-shaped drive key engages notches in the shank of the drill and fits a groove in the face of the collet and holder. This provides positive drive, also prevents drill from being pushed back into the collet under feeding pressure.

"Automatic" SPRAY Sprinkler

LIFE - PROPERTY - MONEY SAVER!

Here's the most revolutionary development in the science of fire protection. Now, new buildings or buildings that are not presently fire safe can realize substantially better protection and — **at no additional cost.** Sprinklered properties can be made **PLUS-SAFE** by merely replacing old style sprinkler heads with the new "Automatic" **SPRAY** Sprinklers.



An investment in "Automatic" **SPRAY** Sprinkler protection is an investment in the future security of your own business. Get complete information from your nearest "Automatic" Sprinkler fire safety engineer or clip and mail the coupon for our free illustrative folder.

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CITY _____ ZONE _____ STATE _____

NEW PRODUCTS and equipment

Continental Tool Works, division of Ex-Cell-O Corp., Dept. ST, 1200 Oakman Blvd., Detroit 32, Mich.

USE REPLY CARD—CIRCLE No. 7

Predetermined Counters

. . . control production runs

SP small predetermined Productimeters are designed for both stroke and rotary application. They control production to exact quantities required and eliminate losses due to over runs and under runs. Count may be set for any figure up to 99,999. Durant Mfg. Co., Dept. ST, 1985 N. Buffum St., Milwaukee 1, Wis.

USE REPLY CARD—CIRCLE No. 8

Photocopying Machine

. . . printer, timer unnecessary

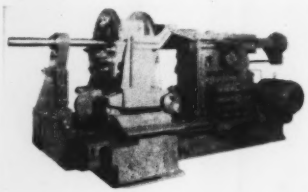
An all-in-one photocopying machine incorporates the advantages of the Apeco Auto-Stat and an automatically controlled light intensity printer that eliminates the necessity of a separate printer and timer. It works on a light intensification and transfer facsimile principle and uses two different types of paper. American Photocopy Equipment Co., Dept. ST, 2849 N. Clark St., Chicago 14, Ill.

USE REPLY CARD—CIRCLE No. 9

Hydraulic Draw-Cut Shaper

. . . machines steel breech rings

Draw-Cut shaper is designed especially for machining rectangular tapered openings in forged or cast steel breech rings from 76 to 155 mm sizes. For this operation, all



controls are brought forward so the operator has complete view at all times. Ram is reciprocated hydraulically. An arbor within the ram provides rotary incremental feeds to the slotter bar in sizes from 3 to 4½ inches diameter.

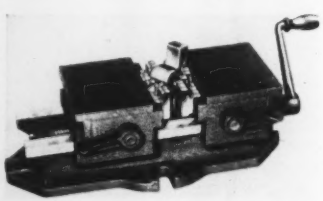
Special cradle-type fixture has both horizontal and vertical incremental feeds and power traverse. Breech ring can be completely rough machined in the inside of the rectangular opening without removal from the fixture. Morton Mfg. Co., Dept. ST, Muskegon Hts., Mich.

USE REPLY CARD—CIRCLE No. 10

Variable Grip Vise

. . . grips all shapes, contours

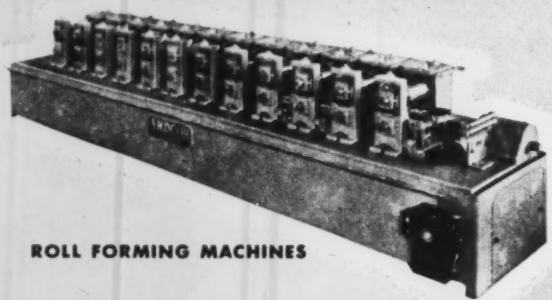
Vise has a gang of serrated or plain steel fingers, each independently slidable toward or away from



its opposing member. It operates without jigs or fixtures, is adaptable to all types of machine tools.

ARDCOR Engineered

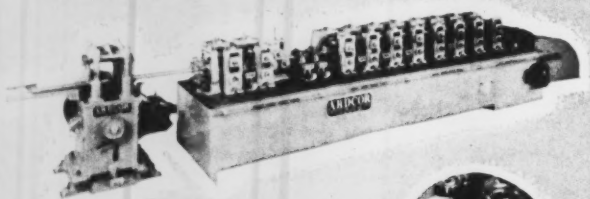
MEANS BETTER COLD-ROLL FORMING



ROLL FORMING MACHINES

PUNCH TYPE CUT-OFFS

LOCK SEAM TUBE MILLS



ARDCORLOY TUBING ROLLS AND FORMING ROLLS

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American ROLLER DIE CORPORATION

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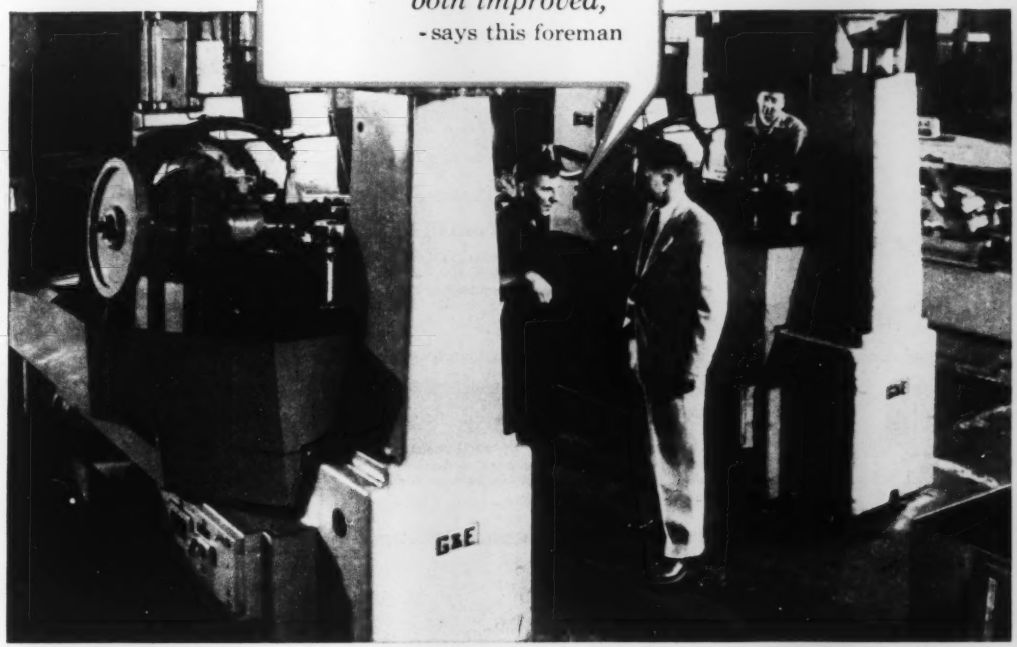
alloy steel drive gears for M-47 tank

hob better with GULF ELECTRO CUTTING OIL!

"Hob life and tooth finish both improved," - says this foreman



Operation—cutting involute teeth on alloy steel spur gears. Gould and Eberhardt Gear Hobbers; results with Gulf Electro Cutting Oil—Hob life increased 20%, scuff marks eliminated on gear teeth, and hob grinding costs reduced.

Here's the important reason why Gulf Electro Cutting Oil produces outstanding results like these: Thanks to a special Gulf process of combining sulphur, it provides greater sulphur activity over the entire range of a cutting operation. This means longer tool life and better finishes.

Call in a Gulf Sales Engineer today and arrange to use this quality cutting oil on your tough machining operations, or send the coupon below for additional information.

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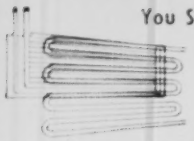
REPLACE PIPE COILS

to SAVE YOU 50% in TANK HEATING and cooling



You SAVE 50% in tank SPACE

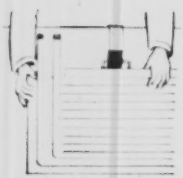
A 22" x 47" Platecoil gives the same heat transfer surface as 32 ft. of 1½" pipe. This pipe requires a space approximately 30" x 60". Platecoil thus saves about 50% over equivalent pipe coil in space inside your tank.

You SAVE up to 50% in initial COST

The initial cost of stainless steel Platecoil is often 50% or more below the cost of equivalent pipe coil. Less time is required to install Platecoil with corresponding saving in installation labor.

You have 50% LESS WEIGHT to handle

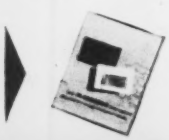
Weighing only about half as much as equivalent pipe coil, Platecoil is easy to handle. A whole maintenance crew is not needed to transport and install it.



You SAVE 50% in maintenance LABOR

The Platecoils can be replaced in a matter of minutes and without emptying the tank. There is no need for workmen to get inside the tank in order to make replacements.

Send for your free copy of the new brochure of Platecoil applications. Write for Bulletin No. P-2.



PLATECOIL

KOLD-HOLD MFG. CO.

LANSING 4, MICHIGAN

NEW PRODUCTS and equipment

After machining one piece of work identical with a group of others, jaws are released slightly but mold or matirx is retained ready for the next piece without realignment.

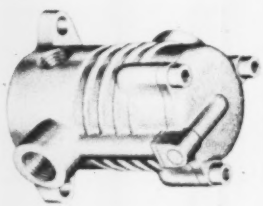
Even pressure distribution grips all contours of odd shaped pieces. Each jaw of model 1000 contains nine independent fingers; model 2100 has 12 fingers. Connors & Davis Sales Corp., Dept. ST, Circuit Ave., W. Springfield, Mass.

USE REPLY CARD—CIRCLE No. 11

Solenoid Pilot Valve

. . . has only two moving parts

Solenoid pilot valve is 3 inches high, handles air, vacuum, oil, water and inert gases. Body and coil are high tensile zinc base alloy. Standard coil is adaptable to either continuous or intermittent service. Completely sealed coil is cooled



by fluid or air passing through the valve.

Plunger and stem are the only moving parts. Stem is one-piece and unbreakable. Models include two and three-way, open or closed. Orifice sizes available: 1/16, 3/32, 1/8-inch, with 1/4-inch pipe tap. Valvair Corp., Dept. ST, 965 Beardsley Ave., Akron 11, O.

USE REPLY CARD—CIRCLE No. 12

Magnetic Lifter and Feeder

. . . feeds steel into presses

Magnetic hand tool for feeding steel into punch presses can be adjusted quickly for pieces of almost any size or shape. Self-aligning magnetic blocks overcome irregularities, dirt or chips. Slight twist effects immediate release.

Other applications include separating stacked sheets; feeding sheets, formed parts or even castings; and removing slugs from dies. Magnetool Division, Multifin-

tool steel is our pride and joy!

Think of tool steel — think of Crucible! That's the reputation we've had for over half a century with our tool steel users. We've never stopped working to maintain our leadership . . . leadership that has kept us the country's *number one* tool steel producer.

Crucible research and development continues to match Industry's need for new and improved tool steels. You can profit from the experience gained by Crucible in the application of tool steels to thousands of uses. Our metallurgical service is freely available to you . . . and our conveniently located warehouses maintain a full supply of tool steels for prompt delivery.

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SPECIFY YOUR TOOL STEELS BY THESE BRAND NAMES

Rex® High Speed Steels
Peerless Hot Work Steels
Halcomb 218
Chro-Mow®
Sanderson Carbon Tool Steels
Ketos®
Airkool Die Steel
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CSM 2 Mold Steel
La Belle® Silicon #2
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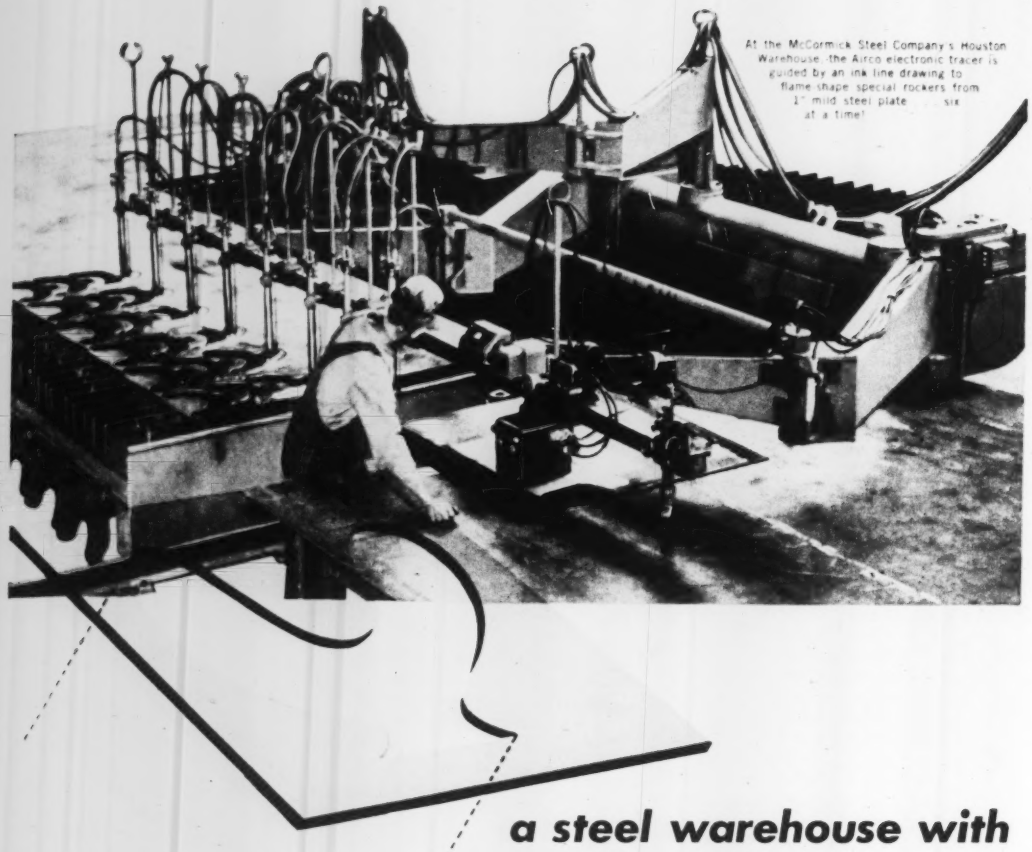
CRUCIBLE first name in special purpose steels

52 years of *Fine* steelmaking

TOOL STEELS

CRUCIBLE STEEL COMPANY OF AMERICA · TOOL STEEL SALES · SYRACUSE, N. Y.



At the McCormick Steel Company's Houston Warehouse, the Airco electronic tracer is guided by an ink line drawing to flame-shape special rockers from 1" mild steel plate . . . six at a time!

a steel warehouse with a "custom-cutting" department!

That's McCormick Steel of Houston, Texas! By installing an Airco No. 50 multi-torch cutting machine, they've boosted steel orders with an entirely new type of service . . .

Here's how it works: customers supply an outline drawing or paper cutout of the required part. An "electronic eye" traces the guide with hairline accuracy. Irregular shapes, inside and outside square corners, obtuse angles, slim slots and intricate contours — the Airco No. 50 Travograph takes 'em all in stride. Circles up to 12 feet in diameter — thicknesses up to 6 inches! By keeping all 8 torches in operation, McCormick mass produces intricate shapes so accurately that further machining is, in most cases, unnecessary.

The Airco No. 50 Travograph cuts light plates, heavy slabs, billets or forgings . . . to minute tolerances . . . with virtually no limit on shape or size. Complete details are available by contacting your nearest Airco office.

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at the frontiers of progress you'll find

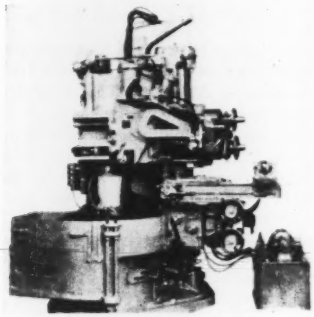
ish Mfg. Co., Dept. ST-525, 2114 Monroe, Detroit 7, Mich.

USE REPLY CARD—CIRCLE No. 13

Hydraulic Lathe Duplicator

. . . higher, deeper contours

Vertical slide hydraulic duplicating attachment applied to a Niles 42 50-inch sidehead lathe forms a combination that permits the machine to contour turn to greater height and gain deeper contour bores. Vertical slide gives infinite-



ly variable feed rates plus rapid travel.

Four-way turret tool block allows rough and finish cuts to be taken without altering adjustment of the contour follower. Grooving tools also can be used in conjunction with the vertical slide. Attachment is integral with the Niles sidehead vertical lathe or can be obtained to fit any other make of standard machine. Turchan Follower Machine Co., Dept. ST, 8259 Livernois, Detroit 4, Mich.

USE REPLY CARD—CIRCLE No. 14

Sheet Metal Hole Puncher

. . . combines punch, die, stripper

Perforating unit combines punch, die and stripper into a two-piece assembly that can be fastened readily to any type of plate press or press brake. This alternating current tool is thus able to handle short run punching jobs without the use

Made Especially for Fast Gaging of Sheet Iron and Steel

For Hot or Cold Sheets

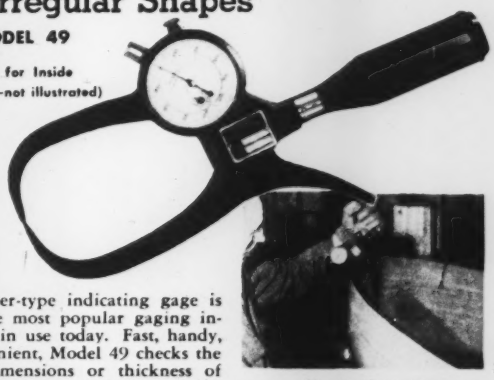
MODEL 644

This gage automatically positions itself perpendicular to sheet to assure quick, accurate measurement of sheet and strip stock. Model 644 has many uses besides use on hot sheets such as — gaging material in receiving room to confirm size delivered, checking thickness of material drawn from stock room for manufacturing, and determining thickness of plating by measuring stock before and after plating operation. Furnished with direct or continuous reading dial, depending on use of gage.

For Irregular Shapes

MODEL 49

(Model 149 for Inside Dimensions—not illustrated)

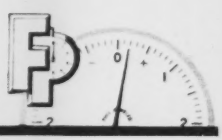


This caliper-type indicating gage is among the most popular gaging instruments in use today. Fast, handy, and convenient, Model 49 checks the outside dimensions or thickness of many articles where the tolerances are not exceedingly close. Patterns, cores, castings, forgings, plastics, dies, glass bottles, sheet material are but a few of hundreds of parts checked by this gage. Two stock models are available but specially shaped jaws and various sizes will be made to suit your needs. Send prints or samples of work for designs and prices.

Tell us your gaging requirements and we will recommend a gage to tell you what you want to know. Federal Products Corp., 2111 Eddy Street, Providence 1, R. I.

FEDERAL

Largest manufacturer devoted exclusively to designing and manufacturing *all types* of DIMENSIONAL INDICATING GAGES



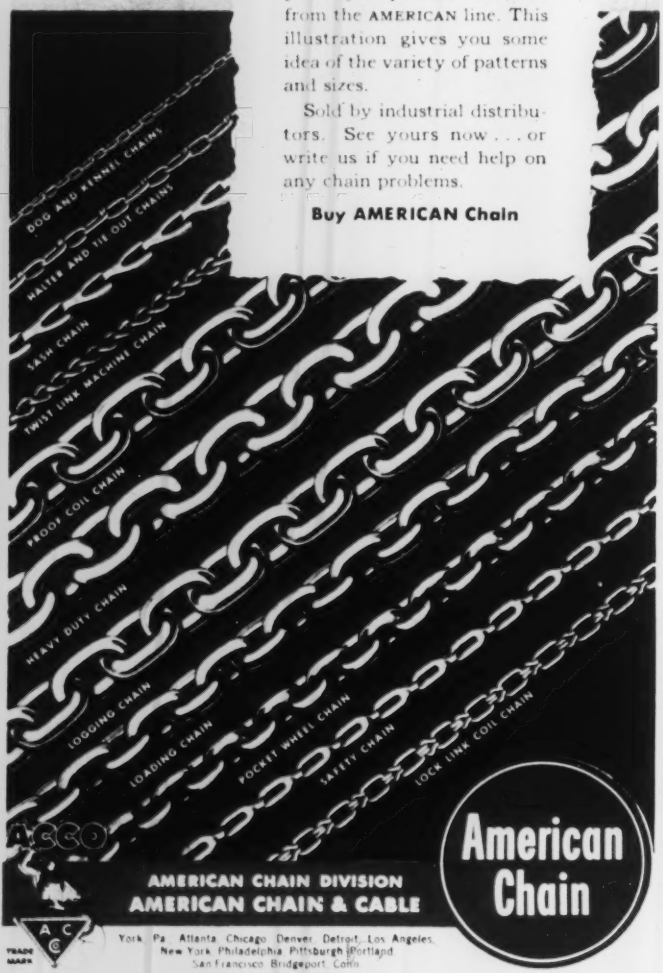
an ACCO product

You Name It . . .
AMERICAN Makes It

● Whether you need welded or weldless chain, or attachments . . . small chain or large . . . for use in your plant or as part of your product . . . choose from the AMERICAN line. This illustration gives you some idea of the variety of patterns and sizes.

Sold by industrial distributors. See yours now . . . or write us if you need help on any chain problems.

Buy AMERICAN Chain



NEW PRODUCTS and equipment

of die sets or other relatively high cost methods.

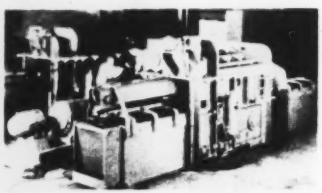
Die button assembly permits installation of compressed air to blast the punched slug out of the die with each stroke of the press or brake. Built-in stripper spring employs the pressfit principle of mounting the punch into the holder. Porter Precision Products Co., Dept. ST, Pipin Rd., Cincinnati, O.

USE REPLY CARD—CIRCLE No. 15

Horizontal Broaching Machine

. . . can take drives to 200 hp

Mechanically-driven horizontal broaching machine will broach at a speed of 150 fpm. This machine can be equipped with drives up to 200 hp for high-speed broaching operation. Offered with strokes ranging from 66 to 200 inches, the unit employs a special-type elec-



tric drive fed by its own power unit to gain wide range of speeds. Main slide and all other sliding members subject to scoring are lined with natural phenolic plates.

Machine has dual speed through its own control panel. This feature is accomplished automatically by setting the dial for any roughing speed and any finishing speed simultaneously. Lapointe Machine Tool Co., Dept. ST, Hudson, Mass.

USE REPLY CARD—CIRCLE No. 16

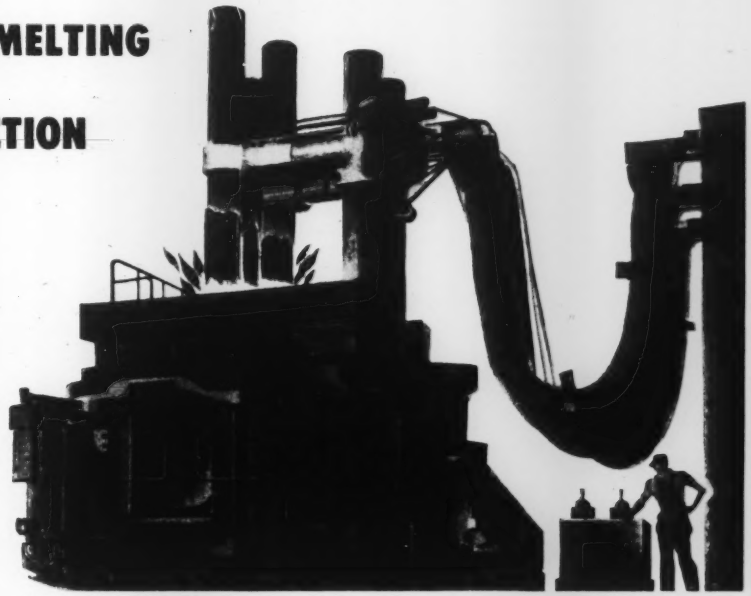
Handle-Type Thermometer

. . protects the operator

With this thermometer a comfortable hand grip is provided on opposite sides of the dial so that it can be plunged directly into hot asphalt, foundry sand, chemical mixtures, etc., without burning the operator. Instrument is available in dial diameters of $4\frac{3}{4}$, 2 13/16 or $2\frac{1}{4}$ inches and can be ordered in stem lengths up to 72 inches. W. C. Dillon & Co. Inc., Dept. ST,

Lectromelt*

FURNACES FOR MELTING, REFINING, SMELTING AND REDUCTION



35 years ago, the first Moore Rapid Lectromelt Furnace was put to work, setting the pace which established these furnaces as leaders in industry. Bold thinking throughout the years has maintained that position and, today, Lectromelt Furnaces are first choice internationally for all types of melting, refining, smelting and reduction.

From the automatic controls that guide the operation of a Lectromelt Furnace to its massive shell, Lectromelt Furnaces are built as production tools. Assembled and mechanically operated on the erection floor at Pittsburgh, they go together faster in your plant, and you get into production with minimum delay.

Lectromelt Furnaces offer you rapid top-charging, high-speed melting, accurate control of quality and low-cost operation. They give long, trouble-free service and correspondingly low upkeep costs. We sell mighty few replacement parts; evidence of their durability.

Catalog No. 8 describes iron and steel melting and refining work. For a free copy, write Pittsburgh Lectromelt Furnace Corporation, 323 32nd Street, Pittsburgh 30, Pennsylvania.

Manufactured in . . . CANADA: Lectromelt Furnaces of Canada, Ltd., Toronto 2 . . . ENGLAND: Birlec, Ltd., Birmingham . . . AUSTRALIA: Birlec, Ltd., Sydney . . . FRANCE: Stein et Roubaix, Paris . . . BELGIUM: S. A. Belge Stein et Roubaix, Brassoux-Liege . . . SPAIN: General Electrica Espanola, Bilbao . . . ITALY: Forni Stein, Genoa.

*REG. T. M. U. S. PAT. OFF.

WHEN YOU MELT... MOORE RAPID Lectromelt

No MYSTERY

Clearing presses are much in evidence in the Kaiser-Frazer Shadywillow plant, opened some months ago in the Wheeling area. The one in the photo is part of a line of four Clearings forming a production group in the new plant.

Kaiser-Frazer knew exactly what they were doing when they chose these Clearing presses. You see, there are Clearing presses in the parent plant at Willow Run, and they've been on the job there for quite a while.

CLEARING MACHINE CORPORATION

6499 WEST 65TH STREET ★ CHICAGO 38, ILLINOIS

HAMILTON DIVISION, HAMILTON, OHIO

CLEARING PRESSES

THE WAY TO EFFICIENT MASS PRODUCTION

NEW PRODUCTS and equipment

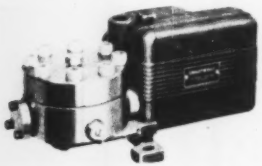
1421 S. Circle Ave., Forest Park, Ill.

USE REPLY CARD—CIRCLE No. 17

Primary Element Transmitter

. . . for use in control systems

Type D2T Autronic differential pressure transmitter, used in conjunction with Autronic control system, covers a differential pressure range of 0-20 inches to 0-200 inches water at static pressures up to 1500 psig. Installed at point of



measurement, unit transmits an electric signal which is directly proportional to variable being measured. Swartwout Co., Dept. ST, 18511 Euclid Ave., Cleveland 12, O.

USE REPLY CARD—CIRCLE No. 18

Machine Welding Torch

. . . mounts on any carriage

Improved heliarc torch for heavy-duty machine welding can be mounted on any machine carriage that provides proper speed

control for repetitive straight-line, shape, girth seam or portable welding operations. Gas leakage and contamination by air are prevented by special gaskets used throughout the torch. Design of

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

INFORMATION

AVAILABLE FOR THE ASKING

71. Steel Tubing Fabrication

Armco Steel Corp.—"How to Fabricate Welded Steel Tubing" is practical 28-page guide which covers cutting, deburring, bending, swaging, tube-end forming, punching, notching, drilling, joining, cleaning and finishing techniques. "How-to-do-it" information is detailed step-by-step in sketches and is explained clearly.

72. Hand Lift Trucks

Barrett-Cravens Co.—Details of the new Barrett hydraulic lift truck are given in 8-page bulletin No. 525. Offered in 2500, 4000 and 6000-lb capacities, this hand operated lift truck includes models with lowered heights of 6 to 11 in. with frame lengths of 36 to 73 in. and 4 or 6-in lifts.

73. Liquid Filtration

Dollinger Corp.—12-page illustrated bulletin D-IL deals with Stay-new liquids filters for water, chemicals and petroleum products. Several types of filter media are available for various liquids and to remove different sizes of foreign metal. Pressures ranging up to 5000 psi, and wide range of flows can be handled.

74. Cutters & Tools

American Cutter & Engineering Corp.—Boylock cutters, a patented device for mechanically holding and locking metal-cutting tool tips which are easily removed and replaced, are subject of 4-page illustrated bulletin 302. Also covered is wide range of special cutting tools made to user's specifications.

75. Hydraulic Tools

Blackhawk Mfg. Co. — Labelled "1001 Valuable Shortcuts with Hydraulic Tools and Hand Tools", 64-page job-picture handbook shows how hydraulic tools can be used to solve production, construction, maintenance and other problems. Described are portable hydraulic jacks and pullers, pipe benders, knock-out punches, hydraulic pumps, torque indicators and hand tools.

76. Lift Truck Batteries

C & D Batteries, Inc.—Two 4-page bulletins, IT-518 and IT-517, offer full description, illustration and tabulated specifications on Slyver-Clad industrial truck batteries and motorized lift truck batteries, respectively.

77. Cutting & Grinding Fluids

Aldridge Industrial Oils, Inc.—"How You Can Reduce Production Costs" is title of 8-page illustrated folder which deals with soluble oils and other cutting and grinding fluids. Booklet recommends proper oil and dilutions for boring, broaching, tapping, threading and other cutting operations on steel, aluminum, bronze and copper.

78. Industrial Spray Nozzles

Binks Mfg. Co.—Industrial spray nozzles for a broad range of processes, including metal cleaning, Bonderizing, spray quenching and gas washing, are described and illustrated in 40-page bulletin No. 5200. Data includes nozzle dimensions, capacities and spray angles.

79. Dust Removal

American Air Filter Co.—14-page illustrated bulletin 515 is entitled "Dust Dollars and Dividends". Presented is brief discussion of the air borne scourge that is ever present, recoverable dollars this dust has cost as an impediment to production and the dividends to be earned by scientific control of dust. Described is complete line of equipment which will make air "as clean as you like it."

STEEL
Penton Building, Cleveland 13, Ohio

11-24-52

Please send literature or detailed information on subjects circled at left to—

NAME _____ TITLE _____

COMPANY _____

PRODUCT OR SERVICE _____

ADDRESS _____

CITY AND STATE _____

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2	12	22	32	42	52	62	72	82
3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
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80. Pressure Sensitive Tapes

Bauer & Black Polyken Industrial Tape Unit. File type "Tape Selector" packet contains six data cards showing basic Polyken tapes, their physical properties and specific industrial uses. Actual samples of general purpose, electrical, specification and special purpose tapes are included. One card deals with Government specification tape data.

81. Reinforced Plastics Resins

Bakelite Co. "Polyester Resins for Reinforced Plastics" is title of 32-page brochure of technical data, actually a primer on the subject. Included are introductory material, properties, comparison of properties with Air Force specifications and many other technical data and graphs.

82. Steam Cleaner

Clayton Mfg. Co. Any live steam line can be converted into an effective cleaning and sterilizing system by the Clayton-Hydro steam cleaner, described and illustrated in 4-page form C-572. Steam picks up, mixes and delivers a driving spray at controlled temperatures and pressures using various cleaning compounds.

83. Selenium Rectifiers

Richardson-Allen Corp. Features and advantages of selenium rectifiers for electroplating and anodizing are set forth in 4-page illustrated booklet. Self-contained units have basic elements and voltage controls in a single cabinet. Data sheets for rectifiers used in industrial truck battery charging and power conversion are also included.

84. Screw Machine Tools

American Cam Co. Screw machine tool users will find valuable dimensional and price information pertinent to cams and tools for automatic screw machines in 12-page illustrated catalog No. 9. Covered are cams; circular, flat forming, dovetail and end forming tools; standard circular form tools; cam, slotting bushing and circular tool blanks; and cam rollers and pins.

85. Metal Coatings

Chemical Corp. Three series of technical data sheets give information on Lusteron Utility, a finish with bright appearance and corrosion resistance; Lusteron Khaki, a chromate type conversion coating for use on electrodeposited zinc plate, zinc die castings and cadmium plate; and treatment of die castings with Lusteron Utility.

86. Steel Conveyor Belt

May-Fran Engineering, Inc. If your plant handles metal scrap, hot forgings, flash, wet or dry metal chips and turnings or other sharp and abrasive materials, you should be interested in the hinged steel conveyor belt described and illustrated in 4-page catalog No. MF-530. Belt can be assembled in almost any width or length from stocked components.

EDITORIAL REPRINTS:

87. Small X-Ray Unit

"Portable as a vacuum cleaner," is the way STEEL reprint entitled "Pint-Size Unit Speeds Radiographic Inspection" describes the 15-in. diameter by 11-in. long x-ray unit developed by General Electric. Unit's versatility is due to "snout" or x-ray source end which protrudes from end of tank and facilitates the inside-out technique of x-ray inspection.

88. Minimum Aisle Widths

How do you avoid costly delays in determining in-plant trailer train aisle widths? J. J. Sichman, Mercury Mfg. Co., engineer, presents some vital points on trailability as determined by fixed wheel and articulate coupler point positions in STEEL reprint "Minimum Aisle Widths."

89. Better Tooling

How Oberdorfer Foundries Inc. and Beaver Machine & Tool Co., both of Syracuse, N. Y., combined their efforts for a retooling job on pump bodies and covers is told in STEEL reprint "Better Tooling Gives Interchangeability." In addition to the time savings that resulted from the joint effort, a big gain in parts interchangeability was realized.

90. Enameling Sheet Problems

All troubles in porcelain enameling don't come from the finishing operation itself. Base metals can get in reject condition enroute from the supplier, while stored or during standby storage along fabricating line. What to watch for at these points and some handling do's and don'ts are presented in STEEL reprint "Path to Enameling Shop Rough on Base Metals."

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8 18 28 38 48 58 68 78 88
9 19 29 39 49 59 69 79 89
10 20 30 40 50 60 70 80 90

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the model HW-13 also minimizes stub loss of tungsten electrodes.

Efficient cooling of torch body, welding head and gas cup is effected by water passages inside the body. Nozzle size range provides ample gas flow for operations requiring up to 500 amp. Linde Air Products Co., division of Union Carbide & Carbon Corp., Dept. ST, 30 E. 42nd St., New York 17, N. Y.

USE REPLY CARD—CIRCLE No. 19

Concentric Grinder

. . . reduces out-of-round in bore

Workholding method incorporated in the 4-inch concentric grinder makes it possible for workpieces such as antifriction bearing races or rings to be outside diameter ground within extremely close concentricity limits.

The method is designed to reduce a large amount of out-of-

round that may be present in the bore. Workholding principle employs a revolving face plate that is a permanent magnet. Workpiece revolves about an arbor that has two wear-resistant strips set in lengthwise.

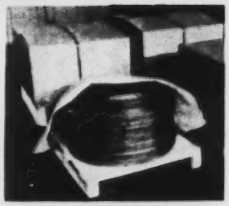
The 16-inch diameter grinding wheel is driven from a 3-hp motor. An automatic unit that loads and unloads the work arbor is available. Landis Tool Co., Dept. ST, Waynesboro, Pa.

USE REPLY CARD—CIRCLE No. 20

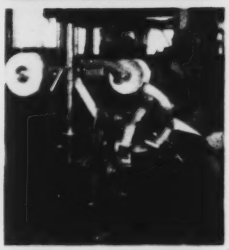
USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information

VPI shroud — no oil or goo used



Angier VPI peripheral wrap



VPI Wrap used as an insert

Vapor from paper STOPS RUST

Simple as it seems, this Angier paper is merely placed near metal to *prevent rust*. It gives off a vapor that makes air and moisture harmless to steel.

Angier VPI® Wrap makes coating with oil or goo a needless chore. All "cleaning" costs are saved. Metal stored or shipped with VPI always is ready for instant use . . . what *sales appeal* for your products! Rejects due to rust are eliminated.

If *your* products must be guarded from rust (for days or *years*) send the coupon now for facts.

Angier

DISTRIBUTORS IN PRINCIPAL CITIES

The Most Experienced Name in Vapor Rust Preventives

Angier Corp., Framingham 8, Mass.

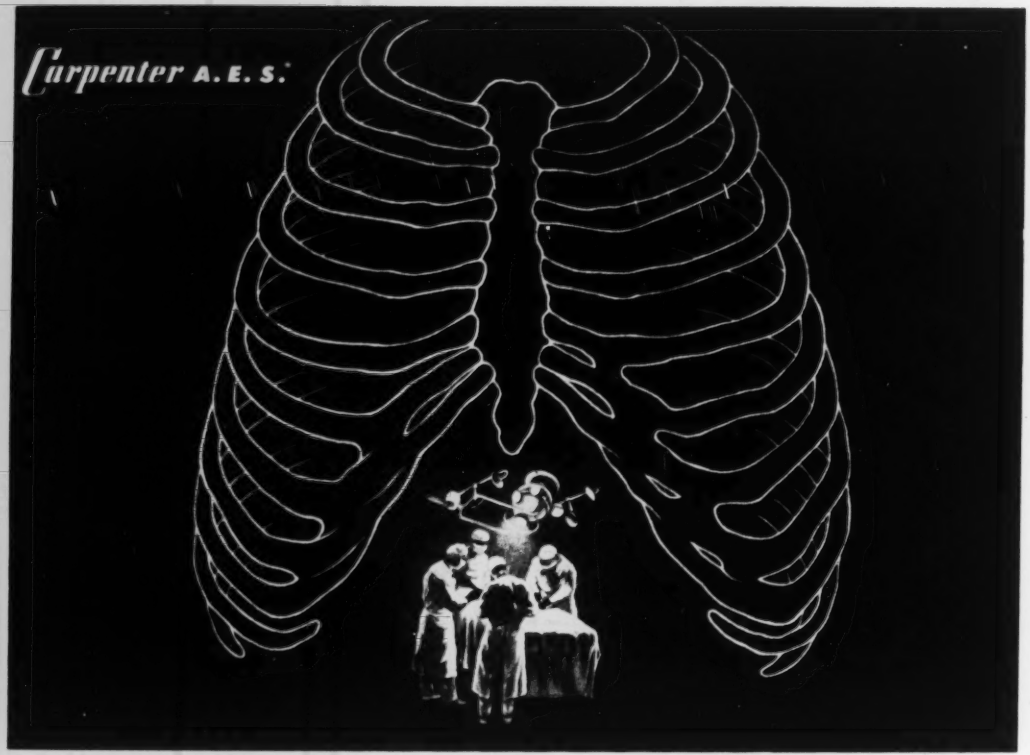
Name .....

Title .....

(Clip this to your letterhead)

Please send "VPI Facts" as applied to:

- ☐ Machinery, Industrial, Metal Working, Farm, Office, Construction
- ☐ Electrical Machinery, Appliances, Products
- ☐ Transportation Equipment — Auto, Aircraft, Naval, Railroad, etc.
- ☐ Fabricated Products — Cutlery, Hardware, etc.
- ☐ Steel in process of fabrication
- ☐ Ordnance Equipment
- ☐ Instruments and clocks
- ☐ Other



"Stretching" Human Ribs for Better Surgery

Another example of how Carpenter Application Engineering Service is working for industry

Look down a long hospital corridor late at night. A soft light gleams over the operating room. Inside, skilled hands, working with modern instruments, are prolonging another life. And one of the instruments often in use is a rib spreader . . . employed to separate ribs in the human body during a chest operation. A vital part of the spreader is the rack that supports the two jaws. It must have strength to remain rigid when the patient breathes heavily under anaesthesia. Its finish must be bright, smooth, sanitary. Above all, it must be *available* to meet the needs of many hospitals.

The manufacturer first tried an ordinary Type 416 Stainless Steel to make the rack. But because of difficulties in machining, he couldn't produce the spreader fast enough to fill critical orders. Here is how Carpenter Application Engineering Service paid off. Carpenter Stainless No. 5, Type 416 was recommended . . . a *free-machining* Stainless invented by Carpenter some years ago. With No. 5 the manufacturer upped production 25% and obtained more uniform hardening qualities in heat treatment.

Here is just one more case wherein industry has found a way to make better products and hold down costs . . . with the help of Carpenter Application Engineering Service. A.E.S. is yours to profit by when you do business with Carpenter. THE CARPENTER STEEL CO., 139 W. Bern St., Reading, Pa.

Carpenter STEEL — **Tool, Alloy and Stainless Steels**

Pioneering in Improved Tool, Alloy and Stainless Steels Through Continuing Research

The Market Outlook

STEEL INDUSTRY men are amazed at the way steel demand holds up.

At the end of the steelworkers' strike they thought demand soon would show definite signs of tapering off after the first quarter of 1953. Now they're becoming inclined to push the date farther back into 1953, even though steel capacity and production will still be growing.

HERE'S WHY—What's responsible for the sustainment of demand? Several factors. Defense production is near full speed. Business in general remains good. Outcome of the national election produced no bearish sentiment. The automobile industry, the country's biggest consumer of steel, is in a strong drive for production. Steel consumers are not only trying to produce at a high level but are trying to get enough steel to build strike-depleted inventories back to normal levels.

Completion of inventory restoration will lift a substantial amount of pressure off demand.

TOP TOPIC—Nevertheless, steel men are convinced that balance of steel supply and demand are near enough that plans should continue forward for the early removal or relaxation, at least, of government controls on the distribution and use of steel. Even some of the government controllers are thinking in such terms. At the top of the agenda for today's meeting in Washington of the Defense Production Administration's Production Policy Committee is decontrol of carbon steel products on a timetable basis.

THE PLAN—The DPA staff proposal has been worked out for carbon steel only, on the theory that once the decontrol pattern is fixed, it can be applied later to alloy and stainless steel, copper, brass and aluminum. The proposal abandons an earlier plan for maintenance of a stand-by CMP. Instead, it calls for: 1. Maintenance of a full CMP operation with related priority authority for the military and atomic energy programs only; 2. a substitute set of restricted allocation procedures for specific metal products which remain in tight supply because of the size of military and AEC requirements; and 3. periodic compulsory reporting by metal consumers. Aim of the latter is to provide a flow of information on metals consumption that would permit prompt resumption of the CMP in event of all-out war.

DESIRE—The DPA staff would like to see in December the open-ending on carbon steel in the first quarter of 1953. Open-ending would permit mills and distributors to sell steel without adhering to government restrictions whenever it is available beyond the amount needed to fill military or atomic energy orders. Other relaxations would follow as 1953 progresses.

This proposal is one of about five plans for decontrol.

While consumers cannot get all of the steel products they want, the tightest of all items is quality bars and forging billets from 1 inch in diameter up.

OUTLOOK—Another very tight item is heavy plates. Heavy demand for them is expected now to continue through at least the second quarter.

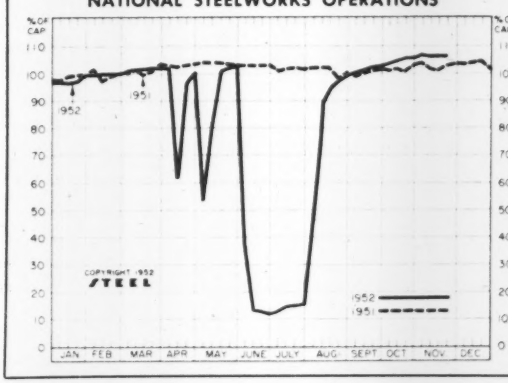
Sheets are a product that evoke surprise. Consumers are exerting considerable pressure for increased quantities from now to the end of the first quarter of next year.

In contrast to the heavy pressure for many of the steel products is the easiness in demand for pig iron. This easiness stems from lack of business among jobbing foundries.

Wire mills too could use more business, although some currently note an improvement.

STEADY STREAM—Over-all demand for steel remains strong enough to keep steel production high and steady. In the week ended Nov. 22, output of steel for ingots and castings was at the same rate as in the preceding week, 106 per cent of capacity. Yield was slightly over 2.2 million net tons. This marked the seventh consecutive week output topped that figure, establishing a record for any like period.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Nov. 22	Change	Same Week 1951	Same Week 1950
Pittsburgh	104.5	+ 1.5*	102	102
Chicago	113	+ 1.5	106.5	105
Mid-Atlantic	101	+ 2	101	100
Youngstown	106	0	106	102
Wheeling	100.5	0	99	99.5
Cleveland	111.5	— 3*	104	101
Buffalo	106.5	0	104	104
Birmingham	106	+ 0.5	100	100
New England	85	— 3	90	91
Cincinnati	99	— 4	102	103
St. Louis	86	12	91.5	95
Detroit	106	0	101.5	106
Western	104	0	102	101
Estimated national rate	106	0	103	102.5

Based on weekly steelmaking capacity of 2,027,040 tons for 1952, 1,966,034 tons for 1951, 1,925,721 tons for second half 1950, 1,906,265 tons for first half 1950.

*Change from revised rate for preceding week.

The Metalworking Outlook—p. 61 Production-Engineering News—p. 97

Composite Market Averages

FINISHED STEEL PRICE INDEX Bureau of Labor Statistics	Nov. 18 1952	Nov. 11 1952	Month Ago	October Average
(1947-1949 = 100)	130.5	130.5	130.7	130.7

AVERAGE PRICES (BUREAU OF LABOR STATISTICS)
Week Ended Nov. 18, 1952

Units are 100 lb except where otherwise noted below in parentheses. For complete description of products see insert following p. 28, STEEL, Sept. 8, 1952.

Rails	$5.775	Sheets, C.R. carbon	$5.275
Track spikes	6.650	Sheets, galv.	6.915
Track bolts	9.958	Strip, C.R. carbon	5.100
Tie plates	4.775	Strip, C.R. stainless (lb)	0.325
Joint bars	4.925	Pipe, black, buttweld (100 ft)	7.090
Plates, carbon	4.150	Pipe, galv., buttweld (100 ft)	8.887
Structural shapes	4.200	Boiler tubes (100 ft)	31.663
Bars, tool steel (lb)	1.576	Tin plate (100 lb base box)	8.950
Bars, 4120 alloy	6.575	Terne plate (100 lb base box)	7.750
Bars, stainless (lb)	0.142	Wire, carbon, merchant	6.075
Bars, carbon	4.100	Wire fence, galv.	6.458
Bars, reinforcing	4.950	Nails (100-lb kegs)	7.390
Bars, C.F. carbon	5.925	Wire, barbed (80 rod spool)	5.920
Sheets, H.R. carbon	4.125	Woven wire fence (20 rod roll)	15.720

FINISHED PRICE INDEX, Weighted

Calculated by STEEL*	Nov. 20 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av. = 100)	181.31	181.31	181.31	171.92	129.28
Index in cents per lb	4.912	4.912	4.912	4.657	3.502

ARITHMETICAL PRICE COMPOSITES
Calculated by STEEL*

Finished Steel, NT	$110.98	$110.98	$110.98	$106.32	$76.09
No. 2 Fdry. Pig Iron, GT	50.04	50.04	50.04	52.24	39.80
Basic Pig Iron, GT	54.66	54.66	54.66	52.16	39.42
Malleable Pig Iron, GT	55.77	55.77	55.77	53.27	37.54
Steelmaking Scrap, GT	43.00	43.00	43.00	43.00	40.42

* For explanation of weighted index see STEEL, Sept. 19, 1949, p. 84; of arithmetical price composites, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS	Nov. 20 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.95	3.95	3.95	3.70	2.90
Bars, H.R., Chicago	3.95	3.95	3.95	3.70	2.90
Bars, H.R., del. Philadelphia	4.502	4.502	4.502	4.223	3.315
Bars, C.F., Pittsburgh	4.925	4.925	4.925	4.55	3.55
Shapes, Std., Pittsburgh	3.85	3.85	3.85	3.65	2.80
Shapes, Std., Chicago	3.85	3.85	3.85	3.65	2.80
Shapes, del. Philadelphia	4.13	4.13	4.13	3.918	2.954
Plates, Pittsburgh	3.90	3.90	3.90	3.70	2.95
Plates, Chicago	3.90	3.90	3.90	3.70	2.95
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.15	3.15
Plates, Sparrows Point, Md.	3.90	3.90	3.90	3.70	2.95
Plates, Claymont, Del.	4.35	4.35	4.35	4.15	3.15
Sheets, H.R., Pittsburgh	3.775	3.775	3.775	3.60-75	2.80
Sheets, H.R., Chicago	3.775	3.775	3.775	3.60	2.80
Sheets, C.R., Pittsburgh	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Chicago	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Detroit	4.775	4.775	4.775	4.55	3.70
Sheets, galv., Pittsburgh	5.075	5.075	5.075	4.80	3.90
Strip, H.R., Pittsburgh	3.75-4.225	3.75-4.225	3.75-4.225	3.75-4.00	2.80
Strip, H.R., Chicago	3.725	3.725	3.725	3.50	2.80
Strip, C.R., Pittsburgh	5.10-5.80	5.10-5.80	5.10-5.80	4.80-5.35	3.55
Strip, C.R., Chicago	5.35	5.35	5.35	4.90	3.65
Strip, C.R., Detroit	5.30-6.05	5.30-6.05	5.30-6.05	4.85-5.60	3.70
Wire, Basic, Pittsburgh	5.10-5.225	5.10-5.225	5.10-5.225	4.85-5.10	3.675
Nails, Wire, Pittsburgh	6.20-6.35	6.20-6.35	6.20-6.35	5.90-6.20	4.625
Tin plate box, Pittsburgh	$8.95	$8.95	$8.95	$8.70	$5.75

SEMIFINISHED					
Billets, forging, Pitts. (NT)	$70.50	$70.50	$70.50	$66.00	$56.50
Wire rods, ¼" to ⅜", Pitts.	4.425	4.425	4.425	4.10-4.30	3.05

PIG IRON, Gross Ton					
Bessemer, Pitts.	$55.50	$55.50	$55.50	$53.00	$37.00
Basic, Valley	54.50	54.50	54.50	52.00	36.00
Basic, del. Phila.	59.25	59.25	59.25	56.61	38.84
No. 2 Fdry., Pitts.	55.00	55.00	55.00	52.50	36.50
No. 2 Fdry., Chicago	55.00	55.00	55.00	52.50	36.00
No. 2 Fdry., Valley	55.00	55.00	55.00	52.50	36.50
No. 2 Fdry., del. Phila.	59.75	59.75	59.75	57.11	39.34
No. 2 Fdry., Birm.	51.38	51.38	51.38	48.88	34.88
No. 2 Fdry. (Birm.) del. Cin.	58.93	58.93	58.93	55.49	38.74
Malleable, Valley	55.00	55.00	55.00	52.50	36.50
Malleable, Chicago	55.00	55.00	55.00	52.50	36.50
Charcoal, Lyles, Tenn.	68.50	68.50	68.50	66.00	50.00
Ferromanganese, Etna, Pa.	228.00	228.00	228.00	188.00	131.00*

* F.o.b. cars, Pittsburgh district.

SCRAP, Gross Ton (including broker's commission)					
No. 1 Heavy Melt., Pitts.	$44.00	$44.00	$44.00	$44.00	$40.00
No. 1 Heavy Melt., P. Pa.	42.50	42.50	42.50	42.50	42.50
No. 1 Heavy Melt., Chicago	42.50	42.50	42.50	42.50	25.75
No. 1 Heavy Melt., Valley	44.00	44.00	44.00	44.00	40.00
No. 1 Heavy Melt., Cleve.	43.00	43.00	43.00	43.00	40.00
No. 1 Heavy Melt., Buffalo	43.00	43.00	43.00	43.00	42.80
Rails, Rerolling, Chicago	52.50	52.50	52.50	52.50	55.50
No. 1 Cast, Chicago	50.00	50.00	50.00	49.00†	49.00

† F.o.b. shipping point.

COKE, Net Ton					
Beehive, Furn., Connsvl.	$14.75	$14.75	$14.75	$14.75	$12.00-12.50
Beehive, Fdry., Connsvl.	17.00	17.00	17.00	17.80	14.00-15.00
Oven, Fdry., Chicago	23.00	23.00	23.00	23.00	17.60

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$56.50	$57.00	$57.50	$58.00
NewYork, del.		60.78	61.28	
Newark, del.	59.52	60.02	60.52	61.02
Philadelphia, del.	59.25	59.75	60.25	60.75
Birmingham District				
AlabamaCity, Ala. R2	50.88	51.38		
Birmingham, R2	50.88	51.38		
Birmingham, S9		51.38		
Woodward, Ala. W15	50.88	51.38		
Cincinnati, del.		58.93		
Buffalo District				
Buffalo, R2	54.50	55.00	55.50	
Buffalo, H1	54.50	55.00	55.50	
Tonawanda, N.Y., W12	54.50	55.00	55.50	
No. Tonawanda, N.Y., T9		55.00	55.50	
Boston, del.	65.15	65.65	66.15	
Rochester, N.Y., del.	57.52	58.02	58.52	
Syracuse, N.Y., del.	58.62	59.12	59.62	
Chicago District				
Chicago, I-3	54.50	55.00	55.00	55.50
Gary, Ind., U5	54.50		55.00	
IndianaHarbor, Ind., I-2	54.50		55.00	
So. Chicago, Ill., W14	54.50	55.00	55.00	
So. Chicago, Ill., Y1	54.50	55.00	55.00	
So. Chicago, Ill., U5	54.50		55.00	55.50
Milwaukee, del.	56.67	57.17	57.17	57.67
Muskegon, Mich., del.		61.30	61.30	
Cleveland District				
Cleveland, A7	54.50	55.00	55.00	55.50
Cleveland, R2	54.50	55.00	55.00	
Akron, O., del. from Cleve.	57.11	57.61	57.61	58.11
Lorain, O., N3	54.50			55.50
Duluth, I-3			55.00	
Erie, Pa., I-3	54.50	55.00	55.00	55.50
Everett, Mass., E1		59.25	59.75	
Fontana, Calif., K1	60.50	61.00		
GraniteCity, Ill., G4	56.40	56.90	57.40	
St. Louis, del. (inc. tax)	57.15	57.65	58.15	
Ironton, Utah, C11	54.50	55.00		
Geneva, Utah, C11	54.50	55.00		
LoneStar, Tex., L6	50.50	*51.00	51.00	
Minnequa, Colo., C10	56.50	57.50	57.50	
Rockwood, Tenn., T3			58.50	
Pittsburgh District				
Neville Island, Pa., P6		55.00	55.00	55.50
Pitts., N.&S. sides, Ambridge				
Aliquippa, del.		56.37	56.37	56.87
McKeesRocks, del.		56.04	56.04	56.54
Lawrenceville, Homestead,				
Wilmerding, Monaca, del.		56.66	56.66	57.16
Verona, Trafford, del.		57.19	57.19	57.69
Brackenridge, del.		57.45	57.45	57.95
Bessemer, Pa., U5	54.50		55.00	55.50
Clairton, Rankin, So. Duquesne, Pa., U5	54.50			
McKeesport, Pa., N3	54.50			55.50
Monessen, Pa., P7	56.50			
Sharpsville, Pa., S6			55.00	55.50
Steelton, Pa., B2	56.50	57.00	57.50	58.00
Swedeland, Pa., A3	58.50	59.00	59.50	60.00
Toledo, O., I-3	54.50	55.00	55.00	55.50
Cincinnati, del.	59.97	60.47		
Troy, N.Y., R2	56.50	57.00	57.50	58.00
Youngstown District				
Hubbard, O., Y1	54.50	55.00	55.00	
Youngstown, Y1	54.50	55.00	55.00	
Youngstown, U5	54.50			55.50
Mansfield, O., del.	59.15	59.65	59.65	60.15

* Low phos., southern grade.

PIG IRON DIFFERENTIAL

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50%, no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton	
(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)	
Jackson, O., G2, J1	$65.50
Buffalo, H1	66.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton	
(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)	
NiagaraFalls, N.Y., P15	$91.00
Keokuk, Iowa, Openhearth & Fdry., frt. allowed, K2	92.50
Keokuk, OH & Fdry., 12½-lb pigiets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., OH & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton	
(Low phos. semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron, Nos. 5 & 6)	
Lyles, Tenn., T3	$68.50

LOW PHOSPHORUS PIG IRON, Gross Ton	
Cleveland, intermediate, A7	$59.50
Steelton, Pa., B2	62.50
Philadelphia, delivered	66.05
Troy, N.Y., R2	62.50

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Semifinished and Finished Steel Products

Mill prices quoted under GCFR as reported to STEEL. Nov. 20, 1952, cents per pound except as otherwise noted. Code numbers following mill points indicate producing company, key on next two pages. Changes shown in italics.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 $81.00
Munhall,Pa. U5 54.00
Seattle B24 75.00

INGOTS, Alloy (NT)
Detroit R7 $57.00
Fontana,Calif. K1 83.00
Houston S5 65.00
Midland,Pa. C18 57.00
Munhall,Pa. U5 57.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 $59.00
Clairton,Pa. U5 59.00
Ensley,Ala. T2 59.00
Fairfield,Ala. T2 59.00
Fontana,Calif. K1 78.00
Gary,Ind. U5 59.00
Johnstown,Pa. B2 59.00
Lackawanna,N.Y. B2 59.00
Munhall,Pa. U5 59.00
So.Chicago,Ill. U5 59.00
So.Duquesne,Pa. U5 59.00

Carbon, Forging (NT)
Bessemer,Pa. U5 $70.50
Buffalo R2 70.50
Canton,O. R2 70.50
Clairton,Pa. U5 70.50
Cleveland R2 70.50
Conshohocken,Pa. A3 77.50
Detroit R7 73.50
Ensley,Ala. T2 70.50
Fairfield,Ala. T2 70.50
Fontana,Calif. K1 89.50
Gary,Ind. U5 70.50
Geneva,Utah C11 70.50
Houston S5 78.50
Johnstown,Pa. B2 70.50
Lackawanna,N.Y. B2 70.50
LosAngeles B3 89.50
Munhall,Pa. U5 70.50
Seattle B3 89.50
So.Chicago R2,U5,W14 70.50
So.Duquesne,Pa. U5 70.50
So.SanFrancisco B3 89.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 $76.00
Buffalo R2 76.00
Canton,O. R2 76.00
Canton,O. T7 76.00
Conshohocken,Pa. A3 83.00
Detroit R7 76.00
Fontana,Calif. K1 95.00
Gary,Ind. U5 76.00
Houston S5 84.00
Ind.Harbor,Ind. Y1 76.00
Johnstown,Pa. B2 76.00
Lackawanna,N.Y. B2 76.00
LosAngeles B3 96.00
Massillon,O. R2 76.00
Midland,Pa. C18 76.00
Munhall,Pa. U5 76.00
So.Chicago R2,U5,W14 76.00
So.Duquesne,Pa. U5 76.00
Struthers,O. Y1 76.00
Warren,O. C17 76.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 $87.50
Canton,O. R2 87.50
Cleveland R2 87.50
Fontana,Calif. K1 100.50
Gary,Ind. U5 87.50
Massillon,O. R2 87.50
So.Chicago,Ill. R2 87.50
So.Duquesne,Pa. U5 87.50

SHEET BARS (NT)
Fontana,Calif. K1(43) $89.00

SKELP
Aliquippa,Pa. J5 $3.65
Munhall,Pa. U5 3.55
Warren,O. R2 3.55
Youngstown R2, U5 3.55

WIRE RODS
Alton,Ill. L1 4.70
AlabamaCity,Ala. R2 4.325
Buffalo W12 4.325
Cleveland A7 4.325
Donora,Pa. A7 4.325
Fairfield,Ala. T2 4.325
Fontana,Calif. K1 5.125
Houston S5 4.725
Johnstown,Pa. B2 4.325
Joliet,Ill. A7 4.325
KansasCity,Mo. S5 4.665
LosAngeles B3 5.125
Minnequa,Colo. C10 4.575
Monessen,Pa. P7 4.325
No.Tonawanda,N.Y. B11 4.325
Pittsburg,Calif. C11 4.975
Portsmouth,O. P12 4.525
Roebling,N.J. R5 4.425
So.Chicago,Ill. R2 4.325
SparrowsPoint,Md. B2 4.425
Sterling,Ill.(1) N15 4.325
Struthers,O. Y1 4.325
Torrance,Calif. C11 5.125
Worcester,Mass. A7 4.625

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 4.675
Lackawanna,N.Y. B2 4.675
Munhall,Pa. U5 4.675
So.Chicago,Ill. U5 4.675

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 3.85
Aliquippa,Pa. J5 3.85
Bessemer,Ala. T2 3.85
Bethlehem,Pa. B2 3.85
Clairton,Pa. U5 3.85
Fairfield,Ala. T2 3.85
Fontana,Calif. K1 4.45
Gary,Ind. U5 3.85
Geneva,Utah C11 3.85
Houston S5 4.25
Ind.Harbor,Ind. I-2 3.85
Johnstown,Pa. B2 3.85
KansasCity,Mo. S5 4.45
Lackawanna,N.Y. B2 3.90
LosAngeles B3 4.45
Minnequa,Colo. C10 3.85
Munhall,Pa. U5 3.85
Niles,Calif.(22) P1 4.06
Phoenixville,Pa. P4 4.10
Seattle B3 4.50
So.Chicago,Ill. U5, W14 3.85
So.SanFrancisco B3 4.10
Torrance,Calif. C11 4.45
Weirton,W.Va. W6 4.10

Wide Flange
Bethlehem,Pa. B2 3.90
Clairton,Pa. U5 3.85
Fontana,Calif. K1 4.45
Johnstown,Pa. B2 3.90
Lackawanna,N.Y. B2 3.90
Munhall,Pa. U5 3.85
So.Chicago,Ill. U5 3.85

Alloy Stand. Shapes
Clairton,Pa. U5 4.725
Fontana,Calif. K1 5.925
Gary,Ind. U5 4.725
Munhall,Pa. U5 4.725
So.Chicago,Ill. U5 4.725

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 5.80
Bessemer,Ala. T2 5.80
Bethlehem,Pa. B2 5.80
Clairton,Pa. U5 5.80
Fairfield,Ala. T2 5.80
Fontana,Calif. K1 6.40
Gary,Ind. U5 5.80
Geneva,Utah C11 5.80
Ind.Harbor,Ind. I-2 5.80
Ind.Harbor,Ind. Y1 6.30
Johnstown,Pa. B2 5.80
Lackawanna,N.Y. B2 5.80
LosAngeles B3 6.35
Munhall,Pa. U5 5.80
Seattle B3 6.40
So.Chicago,Ill. U5 5.80
So.SanFrancisco B3 6.30
Struthers,O. Y1 6.30

H.S., L.A. Wide Flange
Aliquippa,Pa. J5 5.50
Bethlehem,Pa. B2 5.80
Lackawanna,N.Y. B2 5.80
Munhall,Pa. U5 5.75
So.Chicago,Ill. U5 5.75

BEARING PILES
Munhall,Pa. U5 3.85
So.Chicago,Ill. U5 3.85

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 5.95
Bessemer,Ala. T2 5.95
Clairton,Pa. U5 5.95
Cleveland J5, R2 5.95
Conshohocken,Pa. A3 6.20
Ecorse,Mich. G5 6.90
Fairfield,Ala. T2 5.95
Fontana,Calif.(30) K1 6.55
Gary,Ind. U5 5.95
Geneva,Utah C11 5.95
Ind.Harbor,Ind. I-2 5.95
Ind.Harbor,Ind. Y1 6.45
Johnstown,Pa. B2 5.95
Munhall,Pa. U5 5.95
Pittsburgh J5 5.95
Seattle B3 6.85
Sharon,Pa. S3 5.95
So.Chicago,Ill. U5 5.95
SparrowsPoint,Md. B2 5.95
Warren,O. R2 5.95
Youngstown Y1 6.45
Youngstown U5 5.95

PLATES, Open-Hearth Alloy
Claymont,Del. C22 5.35
Coatesville,Pa. L7 5.75
Conshohocken,Pa. A3 5.55
Fontana,Calif. K1 6.20
Gary,Ind. U5 5.25
Johnstown,Pa. B2 5.25
Munhall,Pa. U5 5.25
Sharon,Pa. S3 5.70
So.Chicago,Ill. U5 5.25
SparrowsPoint,Md. B2 5.25

FLOOR PLATES
Cleveland J5 4.95
Conshohocken,Pa. A3 4.95
Ind.Harbor,Ind. I-2 4.95
Munhall,Pa. U5 4.95
So.Chicago,Ill. U5 4.95

PLATES, Ingot Iron
Ashland,c.l. (15) A10 4.15
Cleveland,c.l. R2 4.50
Warren,O.,c.l. R2 4.50

PLATES Carbon Steel
AlabamaCity,Ala. R2 3.90
Aliquippa,Pa. J5 3.90
Ashland,Ky.(15) A10 3.90
Bessemer,Ala. T2 3.90
Clairton,Pa. U5 3.90
Claymont,Del. C22 4.35
Cleveland J5, R2 3.90
Coatesville,Pa. L7 4.35
Conshohocken,Pa. A3 4.35
Ecorse,Mich. G5 4.45
Fairfield,Ala. T2 3.90
Fontana,Calif.(30) K1 4.50
Gary,Ind. U5 3.90
Granite City,Ill. G4 4.60
Geneva,Utah C11 3.90
Harrisburg,Pa. C5 6.50
Houston S5 4.30
Ind.Harbor,Ind. I-2, Y1 3.90
Johnstown,Pa. B2 3.90
Lackawanna,N.Y. B2 3.90
Minnequa,Colo. C10 4.70
Munhall,Pa. U5 3.90
Pittsburgh J5 3.90
Seattle B3 4.80
Sharon,Pa. S3 4.15
So.Chicago,Ill. U5, W14 3.90
SparrowsPoint,Md. B2 3.90
Steubenville,O. W10 3.90
Warren,O. R2 3.90
Weirton,W.Va. W6 4.20
Youngstown R2, U5, Y1 3.90

PLATES, Carbon A.R.
Fontana,Calif. K1 5.65
Geneva,Utah C11 5.05

PLATES, Wrought Iron
(Add 4.7% to base and extras)
Economy,Pa. B14 8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 3.95
Aliquippa,Pa. J5 3.95
Alton,Ill. L1 4.50
Atlanta,Ga. A11 4.50
Bessemer,Ala. T2 3.95
Buffalo R2 3.95
Canton,O. R2 3.95
Clairton,Pa. U5 3.95
Cleveland R2 3.95
Detroit R7 4.10
Ecorse,Mich. G5 4.30
Emeryville,Calif. J7 4.70
Fairfield,Ala. T2 3.95
Fontana,Calif. K1 4.65
Gary,Ind. U5 3.95
Houston S5 4.35
Ind.Harbor,Ind. I-2, Y1 3.95
Johnstown,Pa. B2 3.95
KansasCity,Mo. S5 4.55
Lackawanna,N.Y. B2 3.95
LosAngeles B3 4.65
Milton,Pa. B6 4.55
Minnequa,Colo. C10 4.40
Niles,Calif. P1 4.65
N.Tonawanda,N.Y. B11 3.95
Pittsburg,Calif. C11 4.65
Pittsburgh J5 3.95
Seattle B3, N14 4.70
So.Chicago R2,U5,W14 3.95
So.Duquesne,Pa. U5 3.95
So.SanFran.Cal. B3 4.70
Sterling,Ill. N15 4.55
Struthers,O. Y1 3.95
Torrance,Calif. C11 4.65
Weirton,W.Va. W6 4.10
Youngstown R2, U5 3.95

BAR SIZE ANGLES, S. Shapes
Aliquippa,Pa. J5 3.95
Atlanta A11 4.50
Niles,Calif. P1 4.65
San Francisco S7 5.00

BAR SIZE ANGLES, H.R.CARBON
Bethlehem,Pa. B2 4.15

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 4.675
Buffalo R2 4.675
Canton,O. R2 4.675
Canton,O. T7 4.72
Clairton,Pa. U5 4.675
Detroit R7 4.825
Ecorse,Mich. G5 5.025
Fontana,Calif. K1 5.725
Gary,Ind. U5 4.675
Houston S5 5.075
Ind.Harbor,Ind. I-2, Y1 4.675
Johnstown,Pa. B2 4.675
KansasCity,Mo. S5 5.275
Lackawanna,N.Y. B2 4.675
LosAngeles B3 5.725
Massillon,O. R2 4.675
Midland,Pa. C18 4.30
So.Chicago R2,U5,W14 4.675
So.Duquesne,Pa. U5 4.675
Struthers,O. Y1 4.675
Warren,O. C17 4.675
Youngstown U5 4.675

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 4.925
Gary,Ind. U5 4.925
Youngstown U5 4.925

BARS & SMALL SHAPES H.R.
High-Strength Low-Alloy
Aliquippa,Pa. J5 5.925
Bessemer,Ala. T2 5.925
Bethlehem,Pa. B2 5.925
Clairton,Pa. U5 5.925
Cleveland R2 5.925
Ecorse,Mich. G5 6.675
Fairfield,Ala. T2 5.925
Fontana,Calif. K1 6.975
Gary,Ind. U5 5.925
Ind.Harbor,Ind. I-2 5.925
IndianaHarbor,Ind. Y1 6.425
Johnstown,Pa. B2 5.925
Lackawanna,N.Y. B2 5.925
LosAngeles B3 6.625
Pittsburgh J5 5.925
Seattle B3 6.675
So.Duquesne,Pa. U5 5.925
So.SanFrancisco B3 6.675
Struthers,O. Y1 5.925
Youngstown U5 5.925

BARS, Cold-Finished Carbo
Ambridge,Pa. W18 4.925
BeaverFalls,Pa. R2 4.925
BeaverFalls,Pa. M12 4.925
Buffalo B5 4.975
Camden,N.J. P13 5.025
Carnegie,Pa. C12 4.925
Chicago B5 4.925
Chicago W18 4.925
Cleveland A7, C20 4.925
Detroit P17, R7 5.075
Donora,Pa. A7 4.925
Elyria,O. W3 4.925
FranklinPark,Ill. N5 4.925
Gary,Ind. R2 4.925
GreenBay,Wis. F7 4.925
Hammond,Ind. L2 M13 4.925
Hartford,Conn. R2 5.475
LosAngeles R2 6.375
Mansfield,Mass. B5 5.475
Massillon,O. R2, R8 4.925
Monaca,Pa. S17 4.925
Newark,N.J. W18 5.375
Plymouth,Mich. P5 5.175
Pittsburgh J5 4.925
Putnam,Conn. W18 5.475
Readville,Mass. C14 5.475
St.Louis,Mo. M5 5.30
So.Chicago,Ill. W14 4.925
SpringCity,Pa. K3 5.375
Struthers,O. Y1 4.925
Waukegan,Ill. A7 4.925
Youngstown Y1 4.925
Youngstown F3 4.925

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 6.00
BeaverFalls,Pa. M12 6.00
Bethlehem,Pa. B2 6.00
Buffalo B5 6.00
Camden,N.J. P13 6.40
Canton,O. R2 6.00
Canton,O. T7 5.99
Carnegie,Pa. C12 6.00
Chicago B5 6.00
Chicago W18 6.00
Cleveland A7 6.05
Cleveland C20 6.00
Detroit P17, R7 6.15
Donora,Pa. A7 6.05
Elyria,O. W3 6.00
Gary,Ind. R2 6.00
Hammond,Ind. L2, M13 6.00
Hartford,Conn. R2 6.45
Lackawanna,N.Y. B2 6.00
Mansfield,Mass. B5 6.45
Massillon,O. R2, R8 6.00
Midland,Pa. C18 5.40
Monaca,Pa. S17 6.00
Newark,N.J. W18 6.35
Plymouth,Mich. P5 6.20
So.Chicago,Ill. R2, W14 6.00
SpringCity,Pa. K3 6.20
Struthers,O. Y1 6.00
Warren,O. R2 6.00
Warren,O. C17 6.00
Irwin,Pa. T5 6.00
Waukegan,Ill. A7 6.05
Worcester,Mass. A7 6.35
Youngstown Y1 6.00
Youngstown F3 6.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 3.95
Atlanta A11 4.50
Buffalo R2 3.95
Cleveland R2 3.95
Emeryville,Calif. J7 4.70
Fairfield,Ala. T2 3.95
Fontana,Calif. K1 4.65
Gary,Ind. U5 3.95
Houston S5 4.35
Ind.Harbor,Ind. I-2, Y1 3.95
Johnstown,Pa. B2 3.95
KansasCity,Mo. S5 4.55
Lackawanna,N.Y. B2 3.95
LosAngeles B3 4.65
Milton,Pa. B6 4.55
Minnequa,Colo. C10 4.75
Niles,Calif. P1 4.65
Pittsburg,Calif. C11 4.65
Pittsburgh J5 3.95
SandSprings,Okla. S5 4.85
Seattle B3, N14 4.70
So.Chicago,Ill. R2 3.95
So.Duquesne,Pa. U5 3.95
So.SanFrancisco B3 4.70
SparrowsPoint,Md. B2 3.95
Sterling,Ill.(1) N15 4.70
Struthers,O. Y1 3.95
Torrance,Calif. C11 4.65
Youngstown R2, U5 3.95

BARS, Reinforcing
(Fabricated to consumers)
Huntington,W.Va. W7 5.50
Johnstown, ¼-1" B2 4.75
LosAngeles B3 5.45
Marion,O. P11 5.25
Seattle B3, N14 5.80
So.SanFrancisco B3 5.45
SparrowsPt. ¼-1" B2 4.75
Williamsport,Pa. S19 5.35

RAIL STEEL BARS
Chicago,Ill.(4) C2 5.00
ChicagoHts.(3 4) I-2 4.75
Franklin,Pa.(3,4) F5 5.00
FortWorth,Tex.(26) T4 5.10
Huntingt.W.Va.(3) W7 5.75
Marion,O.(3) P11 4.75
Moline,Ill.(3) R2 4.05
Tonawanda(3,4) B12 5.00
Williamsport(3) S19 5.25
Williamsport(4) S19 5.35

BARS, Wrought Iron
(Add 4.7% to base and extras)
Economy,Pa.(S.R.) B14 9.60
Economy,Pa.(S.E.R.) B14 11.90
Economy(Staybolt) B14 12.20
M&K Rks(Staybolt) L5 14.50
M&K Rks(S.E.) L5 9.60
M&K Rks(D.R.) L5 13.00

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 3.775
Ashland,Ky.(8) A10 3.775
Butler,Pa. A10 3.775
Cleveland J5, R2 3.775
Conshohocken,Pa. A3 4.175
Detroit M1 4.40
Ecorse,Mich. G5 3.925
Fairfield,Ala. T2 3.775
Fontana,Calif. K1 4.725
Gary,Ind. U5 3.775
Geneva,Utah C11 3.875
GraniteCity,Ill. G4 4.40
Ind.Harbor,Ind. I-2, Y1 3.775
Irvin,Pa. U5 3.775
Lackawanna,N.Y. B2 3.775
Munhall,Pa. U5 3.775
Middles O. N12 5.425
Pittsburg,Calif. C11 4.475
Pittsburgh J5 3.775
Sharon,Pa. S3 4.175
So.Chicago,Ill. W14 3.775
SparrowsPoint,Md. B2 3.775
Steubenville,O. W10 3.775
Torrance,Calif. C11 4.475
Warren,O. R2 3.775
Weirton,W.Va. W6 3.775
WestLeechburg,Pa. A4 3.925
Youngstown U5, Y1 3.775

SHEETS, H.S. (19 ga.)
Alabama City, Ala. R2 4.925
Butler,Pa. A10 5.825
Dover,O. R1 6.00
Mansfield,O. E6 5.65
Niles,O. N12 5.675
Torrance,Calif. C11 5.575

SHEETS, H.R. (14 ga. heavier)
High-Strength Low-Alloy
Cleveland J5, R2 5.675
Conshohocken,Pa. A3 5.925
Ecorse,Mich. G5 6.225
Fairfield,Ala. T2 5.675
Fontana,Calif. K1 6.625
Gary,Ind. U5 5.675
Ind.Harbor,Ind. I-2 5.675
Ind.Harbor,Ind. Y1 6.175
Irvin,Pa. T5 5.675
Lackawanna(35) B2 5.675
Munhall U5 5.675
Pittsburgh J5 5.675
Sharon,Pa. S3 5.675
So.Chicago,Ill. U5 5.675
SparrowsPoint(36) B2 5.675
Warren,O. R2 5.675
Weirton,W.Va. W6 6.025
Youngstown U5 5.675
Youngstown Y1 6.175

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 6.925
Ecorse,Mich. G5 7.475
Fontana,Calif. K1 7.875
Gary,Ind. U5 6.925
Indiana Harbor,Ind. Y1 7.425
IndianaHarbor,Ind. I-2 6.925
Irvin,Pa. U5 6.925
Lackawanna(37) B2 6.925
Pittsburgh J5 6.925
SparrowsPoint(38) B2 6.925
Warren,O. R2 6.925
Weirton,W.Va. W6 7.275
Youngstown Y1 7.425

SHEETS, Cold Rolled Steel (Commercial Quality)

Butler Pa. A10	6.50
Cleveland 25, R2	6.25
Conshohocken, Pa. A3	6.50
Fairfield Ala. T2	6.25
Gary, Ind. U5	6.50
Granite City, Ill. G4	6.50
Ind Harbor, Ind. I-2, Y1	6.50
Irvin Pa. U5	6.50
Niles O. R2	6.50
Pittsburg, Calif. C11	7.25
Sparrows Point, Md. B2	6.60
Warren O. R2	6.50
Weirton, W.Va. W6	6.50
Youngstown O. U6	6.50

SHEETS, Galv'd No. 10 Steel

Alabama City, Ala. R2	7.075
Ashland, Ky. A10	7.075
Canton O. R2	7.075
Dearborn, Mich. F3	7.075
Fairfield, Ala. T2	7.075
Gary, Ind. U5	7.075
Granite City, Ill. G4	7.075
Ind Harbor, Ind. I-2	7.075
Irvin Pa. U5	7.075
Kokomo, Ind. C16	7.075
Martins Ferry, O. W10	7.075
Mingo Junction, O. W10	7.075
Niles, O. N12	7.075
Pittsburg, Calif. C11	7.225
Sparrows Point, Md. B2	7.075
Steubenville, O. W10	7.075
Torrance, Calif. C11	7.225
Weirton, W.Va. W6	7.075

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin Pa. U5	7.625
Sparrows Point, Md. B2	7.775

SHEETS, Galvannealed Steel

Canton O. R2	7.625
Irvin Pa. U5	7.625
Rokomo, Ind. C16	7.625
Niles O. N12	7.825

SHEETS, ZINCGRIP Steel No. 10

Butler Pa. A10	7.325
Middletown O. A10	7.325

SHEETS, Electro Galvanized

Cleveland R2, 128#	7.025
Niles O. R2, 128#	7.025
Weirton, W.Va. W6	7.775

SHEETS, Well Casing

Portsmouth, O. K14	5.10
Torrance, Calif. C11	7.275

BLUED Stock, 29 ga

Yorkville, O. W10	7.00
Follansbee, W.Va. F4	7.10
Follansbee, 22d F4	7.425

SHEETS, Enameling Iron

Ashland, Ky. A10	4.925
Cleveland R2	4.925
Gary, Ind. U5	4.925
Granite City, Ill. G4	4.925
Ind Harbor, Ind. I-2	4.925
Irvin Pa. U5	4.925
Middletown O. A10	4.925
Weirton, W.Va. W6	4.925
Youngstown O. U6	4.925

TIN PLATE, Electrolytic (Base Plate)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa, Pa. J5	$7.40	$7.65	$8.05
Fairfield, Ala. T2	7.50	7.75	8.15
Gary, Ind. U5	7.40	7.65	8.05
Granite City, Ill. G4	7.40	7.65	8.05
Ind Harbor, Ind. I-2, Y1	7.40	7.65	8.05
Irvin Pa. U5	7.40	7.65	8.05
Niles O. R2	7.40		
Pittsburg, Calif. C11	8.15	8.40	8.80
Sparrows Point, Md. B2	7.50	7.75	8.15
Weirton, W.Va. W6	7.40	7.65	8.05
Yorkville, O. W10	7.40	7.65	8.05

SHEETS, SILICON, H R or C R COILS (Cut lengths 72" & lower)

	Field	ture	tric	Motor	mo
Beech Bottom, W.Va. W10 (cut lengths)			7.85	9.40	9.90
Brackenridge, Pa. A4			8.35	9.60	10.40
Granite City, Ill. G4 (cut lengths)			8.05	9.80	
Ind. and Harbor, Ind. I-2, Y1	7.50	7.75	8.40	9.45	
Mansfield, O. B6 (cut lengths)	7.60	7.85	8.50	9.10	9.90
Niles, O. N12 (cut lengths)	7.60	7.85	8.50		
Vandergrift, Pa. U5		7.85	8.35	9.60	10.40
Warren, O. R2	7.60	7.85	8.25	9.60	10.40
Zanesville, O. A10		7.85	8.35	9.60	10.40

SHEETS, SILICON (22 Ga. Base) COILS (Cut Length 72" & lower)

Transformer Grade	72	65	58	52
Beech Bottom, W.Va. W10 (cut lengths)	10.45	11.00	11.70	12.50
Brackenridge, Pa. A4	10.95			
Vandergrift, Pa. U5	10.95	11.50	12.20	13.00
Warren, O. R2	10.95			
Zanesville, O. A10	10.95	11.50	12.20	13.00

H R or C R COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler, Pa. A10 (C R)			15.10	15.85
Vandergrift, Pa. U5	13.50	14.35	15.35	15.85

BLACK PLATE (Base Box)

Aliquippa, Pa. J5	$6.25
Fairfield, Ala. T2	6.60
Gary, Ind. U5	6.50
Granite City, Ill. G4	6.50
Ind Harbor, Ind. I-2, Y1	6.50
Irvin Pa. U5	6.50
Niles O. R2	6.50
Pittsburg, Calif. C11	7.25
Sparrows Point, Md. B2	6.60
Warren O. R2	6.50
Weirton, W.Va. W6	6.50
Yorkville, O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee, W.Va. F4	6.10
Gary, Ind. U5	6.10
Granite City, Ill. G4	6.30
Ind Harbor, Ind. Y1	6.20
Irvin Pa. U5	6.10
Yorkville, O. W10	6.30

SHEETS, Culvert No. 16 Pure Iron

Ashland, Ky. A10	6.125
Fairfield, Ala. T2	6.125
Martins Ferry, O. W10	6.125

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland, Ky. A10	4.025
Cleveland R2	4.375
Ind Harbor, Ind. I-2	4.025
Warren O. R2	4.375

SHEETS, Cold-Rolled Ingot Iron

Butler, Pa. A10	5.075
Cleveland R2	5.175
Middletown, O. A10	5.075
Warren O. R2	5.175

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland, Ky. (8) A10	5.325
Canton O. R2	5.525

SHEETS, ZINCGRIP Ingot Iron

Butler, Pa. A10	5.575
Middletown O. A10	5.575

SHEETS, ALUMINIZED

Butler, Pa. A10	8.425

TINPLATE, American 1.25 Coke (Base Box)

	1.50 lb
Aliquippa, Pa. J5	$8.20
Fairfield, Ala. T2	8.80
Gary, Ind. U5	8.70
Ind. Har. I-2, Y1	8.70
Irvin Pa. U5	8.70
Pitts. Calif. C11	9.45
Sparrows Point, Md. B2	8.80
Warren O. R2	8.70
Weirton, W.Va. W6	8.70
Yorkville, O. W10	8.70

MANUFACTURING TERNES (Special Coated)

Fairfield, Ala. T2	$7.85
Gary, Ind. U5	7.75
Irvin, Pa. U5	7.75
Yorkville, O. W10	7.75

SHEETS, LT Coated Ternes, 6 lb

Yorkville, O. W10	$8.65

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary, Ind. U5	$9.75
Yorkville, O. W10	9.75

SHEET, Long Terne Steel (Commercial Quality)

Beech Bottom, W.Va. W10	5.475
Gary, Ind. U5	5.475
Mansfield, O. B6	6.00
Middletown, O. A10	5.475
Niles, O. N12	6.275
Weirton, W.Va. W6	5.475

SHEETS, Long Terne, Ingot Iron

Middletown, O. A10	5.875

ROOFING SHORT TERNES (8 lb. Coated)

Gary, Ind. U5	9.75

STRIP, Hot Rolled High-Strength Low-Alloy

Bessemer, Ala. T2	5.65
Conshohocken, Pa. A3	5.90
Ecorse, Mich. G5	6.30
Fairfield, Ala. T2	5.65
Fontana, Calif. K1	6.55
Gary, Ind. U5	5.65
Ind. Harb. Ind. I-2	5.65
Ind. Harbor, Ind. Y1	6.15
Lackawanna, N.Y. B2	5.70
Los Angeles, Cal. B3	6.40
Niles, O. N12	6.65
Sharon, Pa. S3	5.65
So. San Francisco, (25) B3	6.40
Sparrows Point, Md. B2	5.70
Warren, O. R2	5.65
Weirton, W.Va. W6	6.10
Youngstown, O. U6	6.15
Youngstown, U5	5.65

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland, J5	7.45
Cleveland, A7	7.30
Dover, O. G6	8.00
Ecorse, Mich. G5	8.15
Lackawanna, N.Y. B2	7.90
Sharon, Pa. S3	7.30
Sparrows Point, Md. B2	7.90
Warren, O. R2	7.30
Weirton, W.Va. W6	7.95
Youngstown, Y1	7.80

STRIP, Hot-Rolled Carbon

Ala. City, Ala. (27) R2	3.725
Aliquippa, J5	4.20
Ashland, Ky. (8) A10	3.725
Atlanta, A11	4.275
Bessemer, Ala. T2	3.725
Bridgeport, Conn. (10) S15	4.225
Buffalo, (27) R2	3.725
Butler, Pa. A10	3.725
Carnegie, Pa. S18	4.225
Conshohocken, Pa. A3	4.125
Detroit, M1	4.40
Ecorse, Mich. G5	4.025
Fairfield, Ala. T2	3.725
Fontana, Calif. K1	4.975
Gary, Ind. U5	3.725
Houston, Tex. S5	4.225
Ind. Harbor, Ind. I-2, Y1	3.725
Johnstown, Pa. (25) B2, S7	3.725
Kansas City, Mo. (9) S5	4.325
Lackawanna, N.Y. (32) B2	3.725
Los Angeles, (23) B3	4.475
Milton, Pa. B6	4.35
Minnequa, Colo. C10	4.775
New Britain, (10) S15	4.225
N. Tonawanda, N.Y. B11	3.725
Pittsburg, Calif. C11	4.475
Riverdale, Ill. A7	3.725
San Francisco, S7	5.00
Seattle, (25) B3	4.725
Seattle, N14	4.75
Sharon, Pa. S3	4.225
So. Chicago, Ill. W14	3.725
So. San Francisco, (25) B3	4.475
Sparrows Point, Md. B2	3.725
Sterling, Ill. N15	4.725
Torrance, Calif. C11	4.475
Warren, O. R2	3.725
Weirton, W.Va. W6	3.825
West Leechburg, Pa. A4	3.975
Youngstown, U5, Y1	3.725

STRIP, Hot-Rolled Alloy

Bridgeport, Conn. (10) S15	6.05
Carnegie, Pa. S18	6.45
Fontana, Calif. K1	7.30
Gary, Ind. U5	6.10
Houston, Tex. S5	6.50
Kansas City, Mo. S5	6.70
Midland, Pa. C18	5.85
New Britn. Conn. (10) S15	6.05
Sharon, Pa. S3	6.45
Youngstown, U5	6.10

STRIP, Cold-Rolled Carbon

Anderson, Ind. (40) G6	5.50
Bridgeport, Conn. (10) S15	5.80
Butler, Pa. A10	5.10
Cleveland, A7, J5	5.10
Dearborn, Mich. D3	6.05
Detroit, D2	5.60
Detroit, M1	5.45
Dover, O. (40) G6	5.50
Ecorse, Mich. G5	5.30
Follansbee, W.Va. F4	5.10
Fontana, Calif. K1	6.75
Franklin Park, Ill. (40) T6	5.35
Ind. Harbor, Ind. I-2	5.35
Lackawanna, N.Y. B2	5.10
Los Angeles, C1	6.85
Mattapan, Mass. T6	5.95
Middletown, O. A10	5.10
New Britain, (10) S15	5.80

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Bereg, O. C7		7.65	$.25	10.20	12.50
Bridgeport, Conn. (10); S15	5.80	7.65	$.25	10.20	12.50
Bristol, Conn. W1			$.55	10.50	
Carnegie, Pa. S18		7.65	$.25	10.20	12.50
Cleveland, A7	5.10	7.30	$.25	10.20	12.50
Dearborn, Mich. D3	6.05	7.90	$.50		
Detroit, D2	6.45	7.50	$.10		
Dover, O. G6	5.70	7.65	$.25	10.20	12.50
Franklin Park, Ill. T6	5.45	7.45	$.40	10.35	12.65
Harrison, N.J. C18			$.55	10.50	12.80
Mattapan, Mass. T6	5.95	7.60	$.55	10.50	12.80
New Britn. Conn. (10) S15	5.80	7.65	$.25	10.20	12.50
New Castle, Pa. B4	5.80	7.65	$.25	10.20	
New Castle, Pa. E5	5.80	7.65	$.25	10.20	12.50
New Haven, Conn. D2	6.70	7.90	$.25		
New York, W3		7.95	$.55	10.50	12.80
Pawtucket, R.I. N8, Cleve. or Pitts. Base		7.65	$.25	10.20	12.50
Worcester, Mass. Base	6.30	7.95	$.55	10.50	12.80
Sharon, Pa. S3	5.80	7.65	$.25	10.20	12.50
Trenton, N.J. R5		7.95	$.55	10.50	12.80
Wallingford, Conn. W2	6.30	7.60	$.20	10.15	12.65
Warren, O. T5	6.20	7.65	$.25	10.20	12.50
Weirton, W.Va. W6	5.80	7.65	$.25	10.20	12.50
Worcester, Mass. A7	5.40	7.60	$.55	10.50	12.80
Worcester, Mass. T6	5.95	7.60	$.55	10.50	12.80
Youngstown, O. S.		7.65	$.25	10.20	12.50
Spring Steel (Tempered)					
Trenton, N.J. R5 (25)				10.30	12.50 15.35
Hamilton, N.J. C18				10.30	12.50 15.35
New York, W3				10.30*	12.50* 15.35*
Youngstown, O. S.				10.30	12.50 15.35

* Plus $1.575 per 100 lb.

STRIP, Cold-Rolled Alloy Steel

Bridgeport, Conn. (10) S15	12.15
Carnegie, Pa. S18	12.00
Cleveland, A7	11.40
Dover, O. G6	11.90
Fontana, Calif. K1	13.05
Harrison, N.J. C18	12.00
Midland, Pa. C18	12.00
New Britn. Conn. (10) S15	12.15
Pawtucket, R.I. (11) N8	12.15
Pawtucket, R.I. (12) N8	12.45
Sharon, Pa. S3	12.00
Worcester, Mass. A7	11.70
Youngstown, O. S.	12.00

STRIP, Hot-Rolled Ingot Iron

Ashland, Ky. (8) A10	3.975
Warren, O. R2	4.325

STRIP, Cold-Rolled Ingot Iron

Warren, O. R2	5.70

TIGHT COOPERAGE HOOP

Atlanta, A11	4.45
Riverdale, Ill. A1	4.30
Sharon, Pa. S3	4.55
Youngstown, U5	4.15

STRIP, Electro Galvanized

Dover, O. G6	5.50
Warren, O. T5	5.70
Weirton, W.Va. W6	5.10
Youngstown, O. S.	5.70

STRIP, Cold-Rolled Alloy Steel

Bridgeport, Conn. (10) S15	12.15
Carnegie, Pa. S18	12.00
Cleveland, A7	11.40
Dover, O. G6	11.90
Fontana, Calif. K1	13.05
Harrison, N.J. C18	12.00
Midland, Pa. C18	12.00
New Britn. Conn. (10) S15	12.15
Pawtucket, R.I. (11) N8	12.15
Pawtucket, R.I. (12) N8	12.45
Sharon, Pa. S3	12.00
Worcester, Mass. A7	11.70
Youngstown, O. S.	12.00

STRIP, Hot-Rolled Ingot Iron

Ashland, Ky. (8) A10	3.975
Warren, O. R2	4.325

STRIP, Cold-Rolled Ingot Iron

Warren, O. R2	5.70

TIGHT COOPERAGE HOOP

Atlanta, A11	4.45
Riverdale, Ill. A1	4.30
Sharon, Pa. S3	4.55
Youngstown, U5	4.15

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angel Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.
B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Bethlehem Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boardman Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Div., H. K. Porter Co.
B14 A. M. Byers Co.
C1 Calstrip Steel Corp.
C2 Cannnet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div., Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.
D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
AlabamaCity R2	6.075	6.325
Aliquippa J5	6.075	6.425*
Atlanta A11	6.325	6.675
Bartonville(19) K4	6.075	6.40
Buffalo W12	5.225	....
Cleveland A7	6.075	6.225
Crawfordsville M8	6.175	6.55
Donora,Pa. A7	6.075	6.225
Duluth,Minn. A7	6.075	6.225
Fairfield T2	6.075	6.225
Houston,Tex. B5	6.475	6.625
Johnstown B2	6.075	6.45*
Joliet,Ill. A7	6.075	6.225
KansasCy,Mo. S5	6.675	6.825
Kokomo C16	6.175	6.425
LosAngeles B3	7.025	....
Minnequa C10	6.325	6.70*
Monessen P7	6.075	6.45
Palmer W12	5.525	....
Pitts.,Calif. C11	7.025	7.175
Prtsmth.(18) P12	6.475	....
Rankin A7	6.075	6.225
So.Chicago R2	6.075	6.325
So.S.Fran. C10	7.025	7.40*
SparrowsPt. B2	6.175	6.55†
Sterling,Ill.(1) N15	6.075	6.40
Struthers,O. Y1	6.075	6.475
Torrance,Cal. C11	7.025	....
Worcester A7	6.375	6.525

* Based on 14-cent zinc; † 14.50-cent zinc.

ROPE WIRE

Alton,Ill. L1	....	9.15
Bartonville,Ill. K4	....	8.95
Buffalo W12	....	8.55
Fostoria,O. S1	(43)	8.85
Johnstown,Pa. B2	(43)	8.55
Monessen,Pa. F16	(43)	8.55
Monessen,Pa. P7	(43)	8.80
Muncie,Ind. I-7	(43)	8.75
Palmer,Mass. W12	(43)	8.85
Portsmouth,O. P12	(43)	8.55
Roebling,N.J. R5	(43)	8.85
SparrowsPt. B2	(43)	8.65
Struthers,O. Y1	(43)	8.65
Worcester J4, T6	(43)	8.85

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	....	5.225
Aliquippa,Pa. J5	(42)	4.85
Atlanta A11	....	5.475
Alton,Ill. L1	....	5.45
Bartonville,Ill. K4	....	5.325
Buffalo W12	....	5.225
Chicago W13	....	5.475
Cleveland A7, C20	....	5.225
Crawfordsville,Ind. M8	....	5.325
Donora,Pa. A7	....	5.225
Duluth,Minn. A7	....	5.225
Fairfield,Ala. T2	....	5.225
Fostoria,O. (24) S1	....	5.725
Houston B5	....	5.625
Johnstown,Pa. B2	....	5.225
Joliet,Ill. A7	....	5.225
KansasCity,Mo. S5	....	5.825
Kokomo,Ind. C16	....	5.325
LosAngeles B3	....	6.175
Minnequa,Colo. C10	....	5.475
Monessen,Pa. P7	....	5.475
Newark 6-8 ga I-1	....	5.8
No.Tonawanda B11	....	5.225
Palmer,Mass. W12	....	5.525
Pittsburg,Calif. C11	....	6.175
Portsmouth,O. P12	....	5.625
Rankin,Pa. A7	....	5.225
So.Chicago,Ill. R2	....	5.225
So.SanFrancisco C10	....	6.175
SparrowsPoint,Md. B2	....	5.325
Sterling,Ill.(1) N15	....	5.225
Struthers,O. Y1	....	5.225
Torrance,Calif. C11	....	6.175
Waukegan A7	....	5.225
Worcester A7	....	5.225

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	....	6.20
Buffalo W12	(43)	6.55
Cleveland A7	(43)	5.80
Crawfordsville,Ind. M8	(43)	5.85
Dover,O. G6	....	6.20
Fostoria,O. S1	(43)	6.00
Kokomo,Ind. C16	(43)	5.70
Franklin Park,Ill. T6	(43)	6.20
Massillon,O. R8	(43)	5.85
Monessen,Pa. P16	(43)	6.35
Monessen,Pa. P7	(43)	6.10
Pawtkt.R.I.(12) NS	(43)	6.85
Trenton,N.J. R5	(43)	6.15
Worcester,Mass. A7	(43)	6.15
Worcester,Mass. T6	(43)	6.50
Worcester,Mass. W12	(43)	6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	....	8.90
Monessen,Pa. P16	(43)	8.50
Muncie,Ind. I-7	(43)	8.70
Roebling,N.J. R5	(43)	8.80
SparrowsPt.,Md. B2	(43)	8.60
Johnstown,Pa. B2	(43)	8.50

WIRE (16 gage)	Anl'd	Galv. Stone	Galv. Stone
(Add 4.7% on base and extras)			
Aliquippa J5	10.15	12.15	
Bartonville(19) K4	10.25	12.00*	
Cleveland A7	10.25	11.55	
Crawfrdsville M8	10.25	12.00	
Fostoria,O. S1	10.40	13.00	
Johnstown,Pa. B2	10.75	12.585	
Kokomo C16	10.625	12.325†	
Minnequa C10	10.40	12.425*	
Palmer,Mass. W12	10.25	12.15	
Pitts.,Cal. C11	10.60	11.90	
SparrowsPt. B2	10.84	12.685	
Waukegan A7	10.25	11.55	
Worcester A7	....	11.85	

* Based on 14-cent zinc. † Includes 4.7% increase.

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	(43)	6.25
Alton,Ill. L1	....	6.55
Bartonville,Ill. K4	....	6.61
Buffalo W12	(43)	6.25
Cleveland A7	(43)	6.25
Donora,Pa. A7	(43)	6.25
Duluth,Minn. A7	(43)	6.25
Fostoria,O. S1	(43)	6.25
Johnstown,Pa. B2	(43)	6.25
Monessen,Pa. P16	(43)	6.35
Monessen,Pa. P7	(43)	6.25
Muncie,Ind. I-7	(43)	6.55
Palmer,Mass. W12	(43)	6.55
Pittsburg,Calif. C11	(43)	7.20
Roebling,N.J. R5	(43)	6.55
Portsmouth,O. P12	(43)	6.25
So.Chicago,Ill. R2	(43)	6.25
So.SanFran. C10	(43)	7.20
SparrowsPt.,Md. B2	(43)	6.35
Struthers,O. Y1	(43)	6.25
Trenton,N.J. A7	(43)	6.25
Waukegan,Ill. A7	(43)	6.25
Worcester A7, T6	(43)	6.55
Worcester,Mass. W12	(43)	6.55
Worcester,Mass. J4	(43)	6.75

WIRE, Tire Bead

Bartonville,Ill. K4	....	11.51
Monessen,Pa. P16	(43)	11.40
Roebling,N.J. R5	(43)	11.55

WIRE, Fine & Weaving (8" Coils)

Bartonville,Ill. K4	....	9.42
Buffalo W12	(43)	8.95
Chicago W13	....	9.32
Cleveland A7	(43)	8.90
Crawfordsville,Ind. M8	(43)	8.90
Fostoria,O. S1	(43)	8.90
Johnstown,Pa. B2	(43)	8.90
Kokomo,Ind. C16	(43)	8.90
Monessen,Pa. P16	(43)	8.90
Monessen,Pa. P7	(43)	8.90
Muncie,Ind. I-7	(43)	8.90
Palmer,Mass. W12	(43)	9.20
Robbins,N.J. R5	(43)	9.20
Waukegan,Ill. A7	(43)	8.90
Worcstr,Mass. A7, T6	(43)	9.20

WIRE, Barbed	Col.
AlabamaCity,Ala. R2	144
Aliquippa,Pa. J5	147*
Atlanta A11	149
Bartonville,Ill.(19) K4	146
Crawfordsville,Ind. M8	147
Donora,Pa. A7	142
Duluth,Minn. A7	142
Fairfield,Ala. T2	142
Houston,Tex. S5	144
Johnstown,Pa. B2	147
Joliet,Ill. A7	142
KansasCity,Mo. S5	154
Kokomo,Ind. C16	149
Minnequa,Colo. C10	153*
Monessen,Pa. P7	147
Portsmouth,O. P12	162
Rankin,Pa. A7	142
So.Chicago,Ill. R2	144
So.SanFran.,Calif. C10	167*
SparrowsPoint,Md. B2	145
Sterling,Ill.(1) N15	146

* Based on 14-cent zinc.

WIRE, Upholstery Spring

Aliquippa,Pa. J5	....	6.275
Alton,Ill. L1	....	6.50
Buffalo W12	....	6.275
Cleveland A7	....	6.275
Donora,Pa. A7	....	6.275
Duluth,Minn. A7	....	6.275
Johnstown,Pa. B2	....	6.275
LosAngeles B3	....	7.225
Minnequa,Colo. C10	....	6.525
Monessen,Pa. P7	....	6.275
Monessen,Pa. P16	(42)	6.40
NewHaven,Conn. A7	....	6.575
Palmer,Mass. W12	....	6.375
Pittsburg,Calif. C11	....	7.225
Portsmouth,O. P12	....	6.275
Roebling,N.J. R5	....	6.375
So.Chicago,Ill. R2	....	6.275
So.SanFrancisco C10	....	7.225
SparrowsPoint,Md. B2	....	6.375
Torrance,Calif. C11	....	7.225
Trenton,N.J. A7	....	6.525
Waukegan,Ill. A7	....	6.275
Worcester,Mass. A7	....	6.575

WOVEN FENCE, 9-15½ Ga.	Col.
AlabamaCity,Ala. R2	135
Ala.City,Ala.,17-18ga. R2	222
Aliquippa,Pa. 9-14½ga. J5	131
Atlanta A11	140
Bartonville,Ill.(19) K4	137
Crawfordsville,Ind. M8	140
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Houston,Tex. S5	141
Johnstown,Pa. B2	137
Johnstown,Pa.,2ga.,6" B2	229
Joliet,Ill. A7	133
KansasCity,Mo. S5	145
Kokomo,Ind. C16	140
Minnequa,Colo. C10	146*
Monessen,Pa. P7	138
Pittsburg,Calif. C11	156
Rankin,Pa. A7	133
So.Chicago,Ill. R2	135
Sterling,Ill.(1) N15	137

* Based on 14-cent zinc.

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	132
Atlanta A11	135
Bartonville,Ill.(19) K4	132
Crawfordsville,Ind. M8	134
Donora,Pa. A7	132
Duluth,Minn. A7	132
Fairfield,Ala. T2	132
Joliet,Ill. A7	132
KansasCity,Mo. S5	144
Kokomo,Ind. C16	134
Minnequa,Colo. C10	137
Pittsburg,Calif. C11	156
So.Chicago,Ill. R2	132
So.SanFran.,Calif. C10	156
SparrowsPoint,Md. B2	134
Sterling,Ill.(1) N15	132

FENCE POSTS	
ChicagoHts.,Ill. C2	145
Duluth,Minn. A7	133
Franklin,Pa. F5	145
Huntington,W.Va. W7	148
Johnstown,Pa. B2	148
Marion,O. P11	140
Minnequa,Colo. C10	138
Moline,Ill. R2	136
So.Chicago,Ill. R2	140
Tonawanda,N.Y. B12	148
Williamsport,Pa. S19	158

TRACK BOLTS (20) Treated	
KansasCity,Mo. S5	9.85
Lebanon,Pa. (31) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85

AXLES	
Ind.Harbor,Ind. S13	5.65
Johnstown,Pa. B2	5.65

NAILS, Stock	
To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2 (44)	118
Aliquippa,Pa. J5 (44)	118
Atlanta A11	130
Bartonville,Ill.(19) K4	127
Chicago,Ill. W13 (44)	118
Cleveland A9 (44)	125
Crawfordsville,Ind. M8	130
Donora,Pa. A7 (44)	118
Duluth,Minn. A7 (44)	118
Fairfield,Ala. T2 (44)	118
Galveston,Tex. B5 (44)	126
Houston,Tex. S5 (44)	126
Johnstown,Pa. B2 (44)	118
Joliet,Ill. A7 (44)	118
KansasCity,Mo. S5 (44)	130
Kokomo,Ind. C16	129
Minnequa,Colo. C10 (44)	123
Monessen,Pa. P7	127
Pittsburg,Calif. C11 (44)	137
Portsmouth,O. P12	132
Rankin,Pa. A7 (44)	118
So.Chicago,Ill. R2 (44)	118
SparrowsPoint,Md. B2 (44)	120
Sterling,Ill.(1) N15 (44)	118
Torrance,Calif. C11 (44)	138
Worcester,Mass. A7 (44)	124

STAPLES, Polished, Stuck	
To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2 (44)	118
Atlanta A11	129
Bartonville,Ill. (19) K4	126
Chicago W13	127
Crawfordsville,Ind. M8	128
Donora,Pa. A7 (45)	118
Duluth,Minn. A7 (45)	118
Fairfield,Ala. T2 (45)	118
Johnstown,Pa. B2 (45)	118
Joliet,Ill. A7 (45)	118
Kokomo,Ind. C16	128
Minnequa,Colo. C10 (45)	123
Monessen,Pa. P7	127
Pittsburg,Calif. C11 (45)	137
Portsmouth,O. P12	132
Rankin,Pa. A7 (45)	118
Sterling,Ill.(1) N15 (45)	118
Torrance,Calif. C11 (45)	138
Worcester,Mass. A7 (45)	124

NAILS, Cut (100 lb keg)	
To dealers (33)	
Conshohocken,Pa. A3	$7.80
Wheeling,W.Va. W10	7.80

TIE PLATES	
Fairfield,Ala. T2	4.775
Gary,Ind. U5	4.775
Ind.Harbor,Ind. I-2	4.775
Lackawanna,N.Y. B2	4.775
Minnequa,Colo. C10	$95.50*
Pittsburg,Calif. C11	4.925
Seattle B3	4.925
Steelton,Pa. B2	4.775
Torrance,Calif. C11	4.925

* Per net ton.

JOINT BARS	
Bessemer,Pa. U5	4.925
Fairfield,Ala. T2	4.925
Ind.Harbor,Ind. I-2	4.925
Lackawanna,N.Y. B2	4.925
Minnequa,Colo. C10	4.925
Steelton,Pa. B2	4.925

STANDARD TRACK SPIKES	
Ind.Harbor,Ind. I-2, Y1	6.65
Kansas City,Mo. S5	6.90
Lebanon,Pa. B2	6.65
Minnequa,Colo. C10	6.65
Pittsburgh J5	6.65
Seattle B3	7.15
So.Chicago,Ill. R2	6.65
Struthers,O. Y1	6.65
Youngstown R2	6.65

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	Std. Two Rails 60 lb Under
Bessemer,Pa. U5	3.775	3.675	3.725	4.25
Ensley,Ala. T2	3.775	3.675	....	4.25
Fairfield,Ala. T2	....	....	....	4.25
Gary,Ind. U5	3.775	3.675	3.725	....
Huntington,W.Va. W7	....	....	....	5.25
Indiana Harbor,Ind. I-2	3.775	3.675	3.725	....
Johnstown,Pa. B2	....	....	....	(16)4.25
Lackawanna,N.Y. B2	3.775	3.675	....	4.25
Minnequa,Colo. C10	$75.50*	$73.50*	....	4.75
Steelton,Pa. B2	3.775	3.675	....	....
Williamsport,Pa. S19	....	....	....	5.00

* Per net ton.

TOOL STEEL

(Prices subject to 4.7% increase)

Grade	$ per lb
Regular Carbon	0.270
Extra Carbon	0.370
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.550
Hi-Carbon Cr	0.635

Grade by Analysis

W	Cr	V	Co	Mo	
18	4	1			1.565
18	4	2		1.65-1.66	
20	25	4	25	1.6 12	25 3.535-3.675
19	4	2	7		2.460
18	25	4	25	1 4	75 2.125
18	4	2	9		2.445-2.45
13	5	4	3		1.6025
9	3.25	0.5			1.01

W	Cr	V	Mo	
6	4	4.5	1.9 5	0.96-0.965
6	4	3	6	1.190
1.5	4	1	8.5	0.818

Tool steel producers include: A4, A6, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cwt. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.5c for 17 Ga. & heavier.
(15) 1/8" and thinner
(16) 40 lb and under
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn. base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.85c.
(27) Bar mill sizes.
(28) Bonded.
(29) Add $21.50 per ton.
(30) Shearel; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.85c for cut lengths.
(35) 27" and narrower.
(36) 24" and narrower.
(37) 15 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.025"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Plus 0.375c per 100 lb.
(43) Plus 4.7% on base and extras.
(44) Plus 45c per 100 lb.
(45) Plus 40c per 100 lb.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

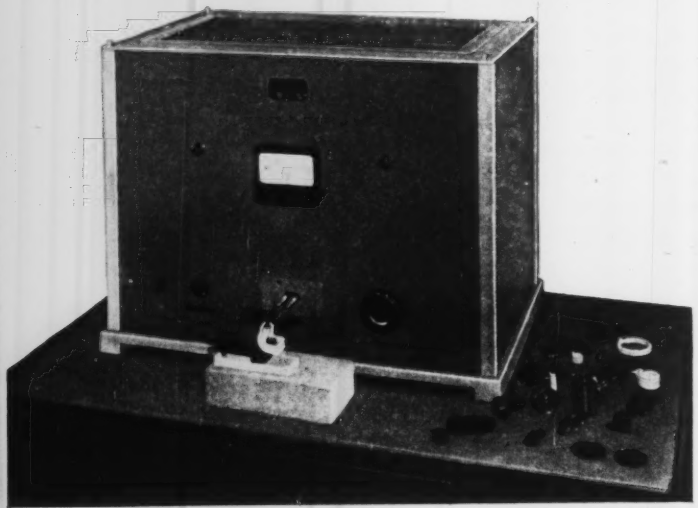
N2 National Supply Co.
N3 National Tube Div.
N5 Nelson Steel & Wire Co.
N6 NewEng-HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

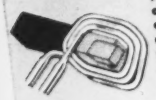
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div., Eaton Mfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Slo-x-Sheffield S.&I. Div.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S24 Seidelhuber Steel
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
U4 Universal Cyclops Steel
U5 United States Steel Co.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West Auto Mach. Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet&Tube

Lepel *presents*

A *Low Cost* PORTABLE HIGH FREQUENCY *Induction* HEATING UNIT

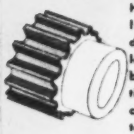


BRAZING



Permits widest choice of silver or copper brazing alloys from lowest to highest melting points. Ideal for brazing carbide tips.

HARDENING



Heat localized exactly where wanted at desired temperature. Ideal for gears, cams, bearing surfaces, cutting tools and other areas that are subject to wear.

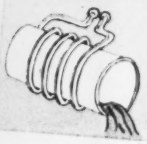
SOLDERING

Speedily and neatly performs intricate soldering applications with or without the use of pre-formed rings.

ANNEALING

Ideal for annealing, stress-relieving, normalizing or pre-heating selected areas.

MELTING



Readily melts quantities of ferrous and non-ferrous metals in either graphite or ceramic crucibles.

- **SMALL AND COMPACT**
  Conveniently operated on bench or table—no mounting necessary.
- **ECONOMICAL OPERATION**
  No special power installation required. Operates on 110 volts, 60 or 50 cycle line at unity power factor.
- **FULLY GUARANTEED**
  Guaranteed for continuous duty cycle and stated performance.

This versatile unit is priced so low that every shop may now take advantage of modern induction heating techniques to improve quality and to increase production. Its simplicity of operation eliminates the need for skilled personnel.

The Lepel Model 2 KW will meet the requirements of machine shops, toolrooms, research laboratories and educational institutions. It is especially suitable for hardening, brazing and soldering small parts of either ferrous or non-ferrous metals.

Complete unit with line connection and load coil.

$870.
f.o.b. factory

WILL HEAT TO 1500° F.

⅛"	steel rod 1" length in approx	1 second
¼"	" " " " "	3 seconds
½"	" " " " "	15 seconds
1"	" " " " "	60 seconds

Will melt 4 ounces of brass or steel in 4 minutes.
Equally well suited for heating of non-ferrous metals.

LEPEL HIGH FREQUENCY LABORATORIES, INC.
55th STREET and 37th AVENUE, WOODSIDE 77, NEW YORK CITY, N. Y.

ALL LEPEL EQUIPMENT IS CERTIFIED TO COMPLY WITH THE REQUIREMENTS OF THE FEDERAL COMMUNICATIONS COMMISSION.
WRITE FOR LEPOL CATALOG ST-11

BUTTWELD STANDARD PIPE, T & C Carload discounts from list %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼		1½		2		2½		3	
List Per Ft	8.5c		11.5c		17c		23c		27.5c		37c		49.5c		58.5c		76.5c	
Pounds Per Ft	0.85		1.13		1.68		2.28		2.73		3.68		5.82		7.62	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (1)	32.5	13.25	35.5	18.25	38	20.75	38.5	20.5	39	21	39.5	21.5	40	21.25	40	21.25				
Alton, Ill. I4	29.5	10.5	32.5	14.5	35	18	35.5	18.5	36	19.5	36.5	20	37	20.5	37	20.5				
Benwood, W. Va. W10	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	21.5	39.5	22	40	21.75	40	21.75				
Etna, Pa. N2 (1)	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	22.25	39.5	22	40	21.75	40	21.75				
Fontana, Calif. K1 (1)	21	1.75	24	5.75	26.5	9.25	27	9	27.5	10	28	10.5	28.5	10.25	28.5	10.25				
Ind. Harbor, Ind. Y1 (1)	31.5	14.25	34.5	18.25	37	21.75	37.5	21	38	22	38.5	22.25	39	21.75	39	21.75				
Lorain, O. N3 (1)	32.5	22.25	35.5	26.25	38	29.75	38.5	27.25	39	25.25	39.5	28.75	40	26.25	40	26.25				
Sharon, Pa. M6	32.5	14.25	35.5	18.25	38	21.25	38.5	20.50	39	21.00	39.5	21.50	40	20.75	40	20.75				
Sparrows Pt., Md. B2	30.5	11.25	33.5	15.25	36	18.75	36.5	18.5	37	19.5	37.5	20	38	19.75	38	19.75				
Youngstown R2 (1)	32.5	13.25	35.5	19.25	38	22.75	38.5	22.00	39	23.00	39.5	23.50	40	22.75	40	22.75				
Youngstown Y1 (1)	32.5	13.25	35.5	19.25	38	22.75	38.5	22.00	39	23.00	39.5	23.50	40	22.75	40	22.75				
Wheatland, Pa. W9	32.5	13.25	35.5	16.25	38	18.75	38.5	18	39	19.5	39.5	20	40	20.25	40	20.25				

SEAMLESS STANDARD PIPE, T & C Carload discounts from list %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.45		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.80		14.81		19.11	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (1)	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Ambridge, Pa. N2	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Lorain, O. N3 (1)	24	12.75	27	12.75	27	12.75	29	14.75	29	14.75	33.75	19.5	33.75	19.5
Youngstown Y1 (1)	24	7.50	27	9.25	27	9.25	29	11.25	29	11.25	33.75	16	33.75	16

ELECTRIC WELD STANDARD PIPE, T & C

Youngstown, R2 (1)	24	7.50	27	9.25	27	9.25	29	11.25	29	11.25	33.75	16	33.75	16

BUTTWELD STANDARD PIPE, T & C Carload discounts from list %

Size—Inches	¼		⅜		½		¾		1		1¼		1½	
List Per Ft	5.5c		6c		9c		12c		$1.00					
Pounds Per Ft	0.24		0.42		0.57		0.80		10.85					
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Benwood, W. Va. W10	29.5	+ 0.25	23.25	+ 3.5	17.75	+ 7.75	33	14.25	33	14.25				
Butler, Pa. B6 (1)	30.5	+ 1.25	25	+ 1.75	20	+ 5.5								
Etna, Pa. N2 (1)	30.5	+ 1.25	25	+ 1.75	20	+ 5.5	33	14.25	33	14.25				
Sharon, Pa. M6 (1)	29.5	+ 0.25	23	+ 4.25	18	+ 8.25								
Sparrows Pt., Md. B2	28.5	+ 0.75	23	+ 3.75	18	+ 7.50								
Youngstown R2 (1)							33	15.25	33	15.25				
Wheatland, Pa. W9	28.5	+ 0.75	23	+ 3.75	18	+ 7.50								

(1)Galvanized pipe discounts based on zinc price of: (1)c, 14c; (2)c, 12.50c; (3)c, 14.50c; (4)c, 16c with discount adjusted depending on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft., mill, minimum wall thickness, cut lengths 10 to 24 ft., inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	14.19	16.21 17.77	16.20	16.20
1¼	13	16.97	19.38 21.26	18.46	19.19
1½	13	18.22 18.77	22.08 22.52	18.19	21.41
1¾	13	20.35 21.35	24.92 25.49	20.69	24.35
2	13	22.81 23.93	27.94 28.58	23.19	27.28
2¼	13	24.69 26.66	31.38 32.18	25.84	30.42
2½	12	28.40 29.36	34.55 35.58	28.16	33.59
2¾	12	31.28 32.17	37.83 39.19	31.19	36.67
3	12	33.87 34.82	40.98 42.44	33.05	38.86
3½	12	36.78 36.87	42.11 44.93	34.98	40.82

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter	
½-in. & smaller diam.	15
⅝-in. & ¾-in.	18.5
⅞-in. and larger	17.5
Longer than 6 in.	
All diams.	14
Lag bolts, all diams.:	
6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire Bolts	21
Boiler & Fitting-Up Bolts	31

NUTS

	Reg. Hvy.
Square	
½-in. & smaller	15 —
⅝-in. & ¾-in.	12 6.5
⅞-in.-1-in.	9 1
1⅛-in. & larger	7.5 1
H.P. Hex	
½-in. & smaller	26 22
⅝-in. & ¾-in.	16.5 6.5
⅞-in.-1-in.	12 2
1⅛-in. & larger	8.5 2
C.P. Hex	
½-in. & smaller	26 22
⅝-in. & ¾-in.	23 17.5
⅞-in. & 1-in.	19.5 12
1⅛-in. & larger	12 6.5

SEMIFINISHED NUTS

(Per cent off list for less than case of keg quantities)

American Standard	Reg. Hvy.
½-in. & smaller	35 28.5
⅝-in. & ¾-in.	29.5 22
⅞-in.-1⅛-in.	24 15
1⅛-in. & larger	13 8.5
	Light
⅞-in. & smaller	35
½-in. to ⅝-in.	28.5
¾-in. to 1½-in.	26

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	18 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1020 steel, packaged, per cent off list)

6 in. or shorter:	
¾-in. & smaller	42
⅞-in. through 1 in.	34
Longer than 6 in.:	
¾-in. & smaller	26
⅞-in. through 1 in.	4

SQUARE HEAD SET SCREWS

(Packaged, per cent off list)

1 in. diam. x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged, per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

RIVETS

F.o.b. midwestern plants

Structural ½-in. larger	7.50c
⅞-in. under	36 off

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plants)

GRAPHITE

Inches Diam.	Length	Cents per lb.
17 to 20	60 to 72	17.85
8 to 16	48 60 72	17.85
7	48 60	19.57
9	48 60	20.95

CARBON

35 40	110	8.03
30	65 84 110	8.03
24	72 to 104	8.03
17 to 20	34 90	8.03

METALLURGICAL COKE

Price per ton

BEEHIVE OVENS

Connellsville fur.	$14.50-15.00
Connellsville fdy.	16.50-17.50
New River foundry	20.50
Wise county, foundry	19.50
Wise county, furnace	18.50

OVEN FOUNDRY COKE

Kearney, N. J. ovens	$22.75
Everett, Mass. ovens	
New England, del.	*24.50
Chicago ovens	23.00
Chicago, del.	24.00
Terre Haute, ovens	22.50
Milwaukee, ovens	23.75
Indianapolis, ovens	22.75
Chicago, del.	26.62
Cincinnati, del.	25.85
Ironton, O., ovens	22.50
Cincinnati, del.	25.12
Painesville, O., ovens	24.00
Cleveland, del.	25.52
Erie, Pa., ovens	23.75
Birmingham, ovens	20.50
Cincinnati, del.	25.23
Lonestar, Tex., ovens	18.50
Philadelphia, ovens	22.70
Nevillesland, Pa., ovens	23.00
Swedeland, Pa., ovens	22.90
St. Louis, ovens	
St. Louis, del.	25.40
Portsmouth, O., ovens	22.50
Cincinnati, del.	25.12
Detroit, ovens	24.00
Detroit, del.	25.00
Buffalo, del.	26.38
Flint, del.	26.73
Pontiac, del.	25.76
Saginaw, del.	27.08

*Or within $4.55 freight zone from works.

COAL, CHEMICALS

Spot, cents per gallon, ovens:	
Pure benzol	30.00-35.00
Toluol, one deg.	26.00-33.00
Industrial xylol	25.00-33.50
Per ton, bulk, ovens	
Sulphate of ammonia	$32-$45
Cents per pound, ovens	
Phenol, 40 crs/lots, non-returnable drums	17.25

FLUORSPAR

Metallurgical grade, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective

CaF2 content 70%	$43
60%	$40

Imported, net ton, duty paid, metallurgical grade, $33-$35.

NOTE: Current prices on clad steels appeared on page 177, Nov. 17, issue.

STAINLESS STEEL

Add 4.75c on base price and extras.

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.25	36.75	31.50
303	43.25	40.25	34.00
304	43.25	38.75	33.00
309	56.00	50.00	44.75
316	57.00	50.00	49.25
321	49.25	48.25	37.00
347	53.75	52.25	41.50
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	42.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Bait, Types 301-347 and 410 sheets except 303 and 309, 82.

Brackenridge, Pa., sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip, F4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502, S18.

Cleveland, strip, A7.

Detroit, strip, M1 quotes 34.00c on Type 301, 36.50c 302, 38.50c on 304, 44.50c 316, 52.00c 347, 30.50c 410, 31.00c 430.

Dunkirk, N. Y., bars, wire, A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars, U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502, J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets, except Type 416, U5.

Harrison, N. J., strip and wire, C18.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410, bars & wire, Types 410 through 430 and 31.25c on Type 302, 34.75c on 302, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347, F2.

McKeesport, Pa., bars, sheets except Type 416, U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502, A10.

Midland, sheets & strip, C18.

Munhall, Pa., bars, U5.

Muncie, Ind., wire 1-7 quotes types 302, 304, 430.

Pittsburgh, sheets, C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309, bars, except 31.50c on Type 301 and 45.25c on 309, C4.

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301, S3.

So. Chicago, Ill., bars & structurals, U5.

Syracuse, N. Y., bars, wire & structurals, C18.

Titusville, Pa., bars, F4.

Wallingford, Conn., strip, W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301, J3.

Washington, Pa., Types 301 through 347 sheets & strip, except 101.00c 316 sheets 62.00c, strip 64.00c, W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire, A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip, except Types 301, 302, 316, 416, 501 and 502 and 34.25c on Type 301, C4.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron	Cents
98+% Fe, annealed	18.00
Unannealed	14.50
Swedish, c.i.f. New York, in bags	8.85-9.95
Electrolytic iron	
Annealed, 99.5+% Fe	42.50
Unannealed, 99+% Fe	36.50
Unannealed, 99+% Fe, minus 325 mesh	53.50
Powder Flakes	48.50
Carbonyl Iron	
97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	31.00
Antimony, 500 lb lots	71.00
Brass, 20-ton lots	28.25-32.00
Bronze, 10-ton lots	31.25-60.00
Phosphor Copper, 20-ton lots	50.00
Copper	
Electrolytic	37.25
Reduced	34.75
Lead	22.50
Magnesium	75.00-85.00
Manganese	
Minus 100 mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel, unannealed	86.00
Nickel-Silver, 5-ton lots	44.50
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302	83.00
Zinc, 10-ton lots	20.00-28.00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	5.85
Less than 1000 lb	6.00
Molybdenum	
99.9% minus 200 mesh	3.24
Chromium, electrolytic 99% Cr min.	3.50

"Every American should have a nest egg"

FREDERICK C. CRAWFORD
President, Thompson Products, Inc.

"That nest egg can be in the form of U. S. Defense Bonds—a patriotic equivalent of cash. Defense-bond dollars grow. Americans who enroll in the Payroll Savings Plan become shareholders in Uncle Sam, Inc. With their chips in the game they are helping the country to deal with problems of finance and inflation. As investors in the nation they are more apt to vote for wise government policies to safeguard their investment."

Certainly every American should have a nest egg—and millions of them will; over 7,000,000 employed men and women, enrolled members of the Payroll Savings Plan, are putting aside approximately $1,500,000,000 per month in the improved U. S. Defense Bonds.

And there is no safer, better way to make dollars grow: the cash value of Series E Bonds held by individuals on December 31, 1954, amounted to $34.3 billion—$4.3 billion more than the cash value of Series E Bonds out-standing in August, 1945.

Employers, too, benefit from the Payroll Savings Plan; the Payroll Saver is a serious worker. He thinks twice before he takes a day off; he's mindful of the effect on his take-home savings. He's a more careful worker; he wants to keep off the accident list. Records show that as employee participation increases, absenteeism and "Lost Time Accidents" decrease and the production curve goes up.

Call for a report on your Payroll Savings Plan. What is the percentage of employee participation? Is the plan being brought to the attention of new employees?

If your percentage is less than 50%, phone, wire or write to Savings Bond Division, U. S. Treasury Department, Suite 700, Washington Building, Washington, D. C. Your State Director will explain how easy it is to conduct a person-to-person canvass that will put a Payroll Savings Blank in the hands of every one of your employees. That's all you have to do. Your employees will do the rest—they *want* to join the plan that provides for their security.

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STEEL
The Weekly Magazine of Metalworking

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H R 18 Ga. Heavier*	C R	Galv. 10 Ga.†	H R *	C R *	H R Rds	C F Rds	H R Alloy 4140††		Carbon	Floor
New York (city)	6.96	7.57	8.77	6.86	...	6.86	7.81‡	13.34	6.69	6.90	8.31
Jersey City (city)	6.35	7.27	8.47	6.75	...	6.39	7.53	9.54	6.35	6.60	8.01
Boston (city)	6.71	7.66	8.73	6.75	...	6.42	7.69‡	10.80‡	6.76	6.95	8.18
Boston (city)	6.51	7.36	8.55	6.55	...	6.42	7.49‡	10.60‡	6.56	6.75	7.98
Phila. (city)	6.36	7.38	8.60	6.70	8.55	6.67	7.70‡	13.04	6.42	6.42	7.62
Phila. (c.l.d.)	6.12	7.13	8.28	6.45	8.30	6.42	7.45‡	10.70	6.17	6.24	7.36
Balt. (city)	6.01	7.37	8.62	6.62	...	6.61	7.62‡	11.37	6.67	6.67	7.90
Balt. (c.l.d.)	5.81	7.17	8.42	6.42	...	6.41	7.42‡	11.17	6.47	6.47	7.70
Norfolk, Va.	7.60	...	...	...	...	6.44	8.45	...	7.25	6.64	7.33
Richmond, Va.	6.14	6.95	8.68	6.55	...	6.30	7.28	...	6.58	6.68	7.80
Wash. (w'house)	6.31	7.61	8.90	6.85	...	6.90	7.78	...	6.93	6.95	8.17
Buffalo (del.)	6.00	6.85	8.66	6.41	...	6.10	7.15‡	11.27	6.28	6.50	7.87
Buffalo (w'hse.)	5.80	6.65	8.46	6.21	...	5.90	6.95‡	11.07	6.08	6.30	7.67
Pitts. (w'hse.)	5.80	6.65	8.05	5.94	...	5.85	6.90‡	10.65	5.95	5.95	7.18
Detroit (w'hse.)	6.07	6.92	8.69	6.13	7.70-8.03	6.12	7.10‡	10.92	6.42	6.47	7.72
Cleveland (del.)	6.00	6.85	8.39	6.20	...	6.09	7.10‡	10.90	6.18	6.32	7.71
Cleve. (w'hse.)	5.80	6.65	8.19	6.00	...	5.89	6.90‡	10.70	6.28	6.12	7.51
Cincin. (city)	6.28	6.87	8.67	6.29	...	6.28	7.31‡	11.22	6.57	6.62	7.75
Chicago (city)	6.00	6.85	8.25	6.03	...	6.03	7.00‡	10.85	6.15	6.15	7.38
Chicago (w'hse.)	5.80	6.65	8.05	5.83	...	5.83	6.80‡	10.65	5.95	5.95	7.18
Milwau. (city)	6.17	7.02	8.42	6.20	...	6.20	7.27‡	11.02	6.32	6.32	7.55
Milwau. (c.l.y.)	5.97	6.82	8.22	6.00	...	6.00	7.07‡	10.82	6.12	6.12	7.35
St. Louis (del.)	6.30	7.14	8.55	6.34	...	6.33	7.40‡	11.15	6.55	6.55	7.78
St. L. (w'hse.)	6.10	6.94	8.35	6.14	...	6.13	7.20‡	10.95	6.35	6.35	7.58
Birmingham (city)	5.95	6.80	7.85‡	5.95	...	5.95	8.40	...	6.10	6.25	8.65
Birm'ham (w'hse.)	5.80	6.65	7.70‡	5.80	...	5.80	8.40	...	5.95	6.10	8.65
Los Ang. (city)	6.80	8.65	9.95	6.95	11.40	6.80	8.81‡	12.25	6.80	6.86	9.67
L. A. (w'hse.)	6.60	8.45	9.75	6.75	11.20	6.60	8.61‡	12.05	6.60	6.66	9.47
Seattle-Tacoma	7.37	9.97	9.60	7.64	...	7.14	9.62‡	10.90‡	6.85	7.20	9.11
S. Fran. (w'hse.)	6.90	8.20	9.60	6.75	...	6.65	8.65‡	12.05	6.50	6.75	8.90

*Prices do not include gage extras. †Prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded). ‡ includes 25-cent special bar quality extra. §As rolled. ††As annealed. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over. ‡‡500 to 1499 lb. §§450 to 1499 lb. ¶¶1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

Old range bessemer	$9.45
Old range nonbessemer	9.30
Mesabi bessemer	9.20
Mesabi nonbessemer	9.05
High phosphorus	9.05

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 1, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Eastern Local Iron Ore

Cents per unit del. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	
Spot	nom.
Long-term contract	24.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 67-69% (spot)	32.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	63.00

Manganese Ore

Manganese, 48% nearby, $1.18-1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$49.00-42.00
48% 3:1	44.00-45.00
48% no ratio	39.00-32.00

South African Transvaal

44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00

Brazilian

44% 2.5:1 lump	nom.

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb. molybdenum content, mines	$1.00

REFRACTORIES

(Ceiling prices, effective Sept. 23, 1952, per 1000 units)

Fire Clay Brick

High Heat Duty: Pueblo, Colo., $89.00; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lochhaven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, Mo., Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $99.30; Salina, Pa., $104.55; Niles, O., $109; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $99.30; Hays, Pa., $105.10; Niles, O., $107; E. Chicago, Ind., Joliet, Rockdale, Ill., $109.70; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° F.: Massillon, O., $178.50; Clearfield, Pa., $179.55; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $186.90.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $69.30; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Peria, Ark., $92.40; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $127; Johnstown, Pa., $127.30; Clearfield, Pa., $135; St. Louis, $138; Athens, Tex., $140.90.

Nozzles

Reesdale, Pa., $203.20; Johnstown, Pa., $208.40; Clearfield, Pa., $219.45; St. Louis, $224.65; Athens, Tex., $225.20.

Runners

Reesdale, Pa., $158.20; Johnstown, Pa., $161.70; Clearfield, Pa., $168.60; St. Louis, $170.30; Athens, Tex., $174.40.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa.; St. Louis, Mexico, Mo., $166.30; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $210.20; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $244.85; Danville, Ill., $247.85; Clearfield, Pa., $252.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%.) Contract, carload, lump, bulk, 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-4%.) Contract, carload, lump, bulk 10.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot add 0.25c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.) Contract, c.l. lump, bulk 7.0c per lb of alloy, c.l. packed 7.75c, ton lot 8.5c, less ton 9.35c. Delivered. Spot add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.) Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing exactly 2 lb of Cr.) Contract, carload, bulk, 14.5c per lb of briquet, carload packed 15.2c, ton lot 16.0c, less ton 16.9c. Deld. Add 0.25c for notching. Spot add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn.) Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si.) Contract, c.l. bulk 12.65c per lb of briquet, c.l. packed 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size, weighing approx. 5 lb and containing exactly 2 lb of Si.) Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.55c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size, weighing approx. 2½ lb and containing exactly 1 lb of Si.) Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each.) $1.11 per pound of Mo contained, f.o.b. Langeloth, Pa.

Note: Current prices on chromium, silicon, vanadium, boron and tungsten alloys appeared on page 179, Nov. 17 issue; manganese and titanium alloys and "other" ferroalloys, page 193, Nov. 10.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Feb. 5, 1952.

STEELMAKING SCRAP COMPOSITE

Nov. 20	$43.00
Nov. 13	43.00
Oct. 1952	43.00
Nov. 1951	43.00
Nov. 1947	40.42

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin:

Basing Point	Grade 1 No. 1 Bundles Dealer-Industrial	Grade 2 No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2 No. 1 Busheling	Base
3 No. 1 Heavy Melting	— $1.00
4 No. 2 Heavy Melting	— 1.00
5 No. 2 Bundles	— 1.00
6 Machine Shop Turnings	— 10.00
7 Mixed Borings and Short Turnings	— 6.00
8 Shoveling Turnings	— 6.00
9 No. 2 Busheling	— 4.00
10 Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11 Billet, Bloom & Forge Crops	+ 7.50
12 Bar Crops & Plate	+ 5.00
13 Cast Steel	+ 5.00
14 Punchings & Plate Scrap	+ 2.50
15 Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate	
16 3 feet and under	+ 3.00
17 2 feet and under	+ 5.00
18 1 foot and under	+ 6.00
19 Briquetted Cast Iron Borings	Base
Foundry Steel	
20 2 feet and under	Base
21 1 foot and under	+ 2.00
22 Springs and Crankshafts	+ 1.00
23 Alloy Free Turnings	— 3.00
24 Heavy Turnings	— 1.00
25 Briquetted Turnings	Base
26 No. 1 Chemical Borings	— 3.00
27 No. 2 Chemical Borings	— 4.00
28 Wrought Iron	+ 10.00
29 Shafting	+ 10.00
11 Odd Tie & Terne Plated Bundles	— 10.00

Unprepared Grades

When compressed constitutes:

32 No. 1 Bundles	— 6.00
33 No. 2 Bundles	— 9.00
34 Other than material suitable for hydraulic compression	— 8.00

Restrictions on Use

(1): Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for grades 12 and 8, respectively.

(2): Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the base of Grade 27 for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.

(3): Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4): Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and acid open-hearth furnaces or foundries, or in basic O-H or blast furnace under NPA allocation or OPS authorization.

(5): Prices for Grade 29 may be charged only when sold for forging or rerolling purposes.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2 No. 2 Heavy Melting Steel	— $2.00
3 No. 2 Steel Wheel	Base
4 Hollow Bored Axles and loco. axles with keyways between the wheelseats	Base
5 No. 1 Busheling	— 3.50
6 No. 1 Turnings	— 3.00
7 No. 2 Turnings, Drillings & Borings	— 12.00
8 No. 2 Cast Steel and uncut wheelcenters	— 6.00
9 Uncut Frogs, Switches	Base
10 Flues, Tubes & Pipes	— 8.00
11 Structural, Wrought Iron and/or steel, uncut	— 6.00
12 Destroyed Steel Cars	— 8.00
13 No. 1 Sheet Scrap	— 9.50
14 Scrap Rails, Random Lengths	+ 2.00
15 Rerolling Rails	+ 7.00
Cut Rails:	
16 3 feet and under	+ 5.00
17 2 feet and under	+ 6.00
18 18 inches and under	+ 8.00
19 Cast Steel, No. 1	+ 3.00
20 Uncut Tires	+ 2.00
21 Cut Tires	+ 5.00
Bolsters & Side Frames	
22 Uncut	Base
23 Cut	+ 3.00
24 Angles, Splice Bars & Tie Plates	+ 5.00
25 Solid Steel Axles	+ 12.00
26 Steel Wheels, No. 3 Size	Base
27 Steel Wheels, No. 3	+ 5.00
28 Spring Steel	+ 5.00
29 Couplers & Knuckles	+ 5.00
30 Wrought Iron	+ 8.00
31 Fireboxes	— 8.00
32 Boilers	— 6.00
33 No. 2 Steel Scrap	— 13.00
34 Carsides, Doors, Car Ends, cut apart	— 6.00
35 Unassorted Iron & Steel	— 6.00
36 Unprepared scrap, not suitable for hydraulic compression	— 8.00

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin, authorized by OPS are:

(1): For preparing into Grades No. 3, No. 4 or No. 2, $8.

(2): For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.

(3): For crushing Grade No. 6, $3. For preparing into:

(4): Grade No. 25, $6.

(5): Grade No. 19, $6.

(6): Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.

(7): Grade No. 17 or No. 21, $11.

(8): Grade No. 18, $12.

(9): For hydraulically compressing Grade No. 15, $8.

(10): For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1): For preparing into Grade No. 1 and Grade No. 2, $8.

(2): For hydraulically compressing Grade No. 13, $6. For preparing into:

(3): Grade No. 16, $4.

(4): Grade No. 17, $5.

(5): Grade No. 18, $7.

(6): Grade No. 21, $4.

(7): Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1): For preparing Grade No. 8 into Grade No. 7, $9.

(2): For preparing Grade No. 3 into Grade No. 11, $7.

(3): For preparing Grade No. 3 into Grade No. 1, $4.

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:	
1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop broken machinery	52.00

OPEN MARKET

(Delivered prices include broker's commission.)

Birmingham

(Delivered)

Shoveling turnings	$30.00-32.00
Cast iron borings	30.00-32.00
No. 1 cupola cast	47.00-48.00
Stove plate	42.00
Charging box cast	39.00-40.00
Heavy breakable	36.00-37.00
Drop broken machinery	42.00-43.00
Unstripped motor blocks	35.00-36.00

Boston

(F.o.b. shipping point)

No. 1 cupola cast	41.00
Heavy breakable	36.00
Stove plate	34.00-35.00
Unstripped motor blocks	30.00

Buffalo

(Delivered)

No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 1 busheling	44.00
No. 2 bundles	43.00
Machine shop turnings	34.00
Mixed borings, turnings	38.00
Cast iron borings	38.00
Short shoveling turnings	38.00
No. 1 cupola cast	45.50-46.50
No. 1 machinery cast	49.00-50.00

Chicago

(Delivered)

No. 2 heavy melting	42.50
No. 2 bundles	42.50
Machine shop turnings	33.50
Mixed borings, turnings	35.00-37.50
Shoveling turnings	37.50
Cast iron borings	35.00-37.50
No. 1 cupola cast	44.00-46.00
Charging box cast	42.00-44.00
Heavy breakable	41.00-43.00
Burnt cast	37.00-39.00
Cast iron brake shoes	39.00-41.00
Stove plate	42.00-44.00
Clean auto cast	47.00-49.00
Unstripped motor blocks	35.00-37.00
Malleable	48.00-51.00
Drop broken machinery	48.00-50.00

Cleveland

(Delivered)

No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 2 bundles	43.00
Machine shop turnings	34.00
Mixed borings, turnings	38.00
Shoveling turnings	38.00
Cast iron borings	38.00

(F.o.b. shipping point)

No. 1 cupola	49.00
Charging box cast	47.00
Burnt cast	41.00
Stove plate	46.00
Clean auto cast	52.00
Unstripped motor blocks	43.00
Malleable	55.00
Drop broken machinery	52.00

Detroit

(F.o.b. shipping point)

No. 1 cupola cast	47.00-48.00
Heavy breakable	43.00-44.00
Clean auto cast	49.00-50.00
Unstripped motor blocks	40.00-41.00
Drop broken machinery	50.00-52.00
Charging box cast	44.00-45.00

† Nominal.

Los Angeles

(Delivered)

No. 1 heavy melting	34.00
No. 2 heavy melting	31.00
No. 1 bundles	35.00
No. 2 bundles	29.00
No. 1 cupola cast	49.00
Machine shop turnings	14.00

New York

(Brokers' buying prices)

No. 2 heavy melting	35.99
Mixed borings, turnings	29.99
Machine shop turnings	25.99
Cupola cast	41.00-42.00
Unstripped motor blocks	32.00-33.00

Philadelphia

No. 1 heavy melting	41.50†
No. 2 heavy melting	41.50†
No. 1 bundles	42.50†
No. 2 bundles	41.50†
No. 1 busheling	42.50†
Mixed borings, turnings	36.50†
Machine shop turnings	32.50†
Short shoveling turnings	36.50†
No. 1 cupola cast	48.00-50.00††
Unstripped motor blocks	40.00††
Heavy breakable	45.00†
Machinery cast	52.00†
Charging box cast	47.00†

†Ceiling price. ‡Nominal
§Shipping point. ††Delivered

Pittsburgh

(Delivered)

No. 2 heavy melting	44.00†
No. 1 bundles	45.00†
No. 2 bundles	44.00†
Machine shop turnings	35.00†
Shovel turnings	39.00†
No. 1 cupola cast	48.50
Heavy breakable	45.00

†Ceiling price.

San Francisco

(Delivered)

No. 2 heavy melting	31.00
Machine shop turnings	14.00
No. 2 bundles	29.00
No. 1 cupola cast	44.00

Seattle

(F.o.b. shipping point)

No. 1 bundles	30.00
No. 1 cupola cast	41.00
Heavy breakable	36.00-38.00
Unstripped motor blocks	31.00

St. Louis

(Delivered)

No. 1 cupola	48.00
Unstripped motor blocks	38.00

Youngstown

(Delivered)

No. 2 heavy melting	43.00
No. 2 bundles	43.00
Machine shop turnings	34.00

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt	$35.50
No. 1 Bundles	35.50
No. 2 Bundles	35.50
Mechanical Bundles	32.00
Mixed Steel Scrap	31.50
Mixed Borings, Turnings	32.50
Rails, Remelting	35.50
Rails, Rerolling	44.50
Busheling	30.00
Busheling new factory:	
Prep'd	33.50
Unprep'd	31.50
Short Steel Turnings	32.50
Cast Iron Grades†	
No. 1 Machinery Cast	50.00

†F.o.b. shipping point.

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The Metal Market

Free foreign trade in metals gets renewed attention as pressure mounts to throw out tariffs and import restrictions . . . Olin Industries to be fourth aluminum producer

PROTECTIVE tariffs and import restrictions on metals once again are under debate. The subject will grow in importance as the new administration takes office and attempts to find workable and permanent solutions to the problems of foreign aid and adequate metals supply.

Proponents of free trade say their course of action would be like removing a bad tooth. Ultimate health counts more than immediate pain. Their argument is that free trade means less aid that U. S. losses in domestic markets will be less than the subsidies paid to nations that could maintain healthy trade balances with obstacles removed. A corollary is that cheaper materials resulting from geographic specialization mean lower ultimate cost of goods. Added to these arguments is the long shadow cast across the metals picture by Paley Report forecasts which don't give much help to advocates of the "buy American" policy.

Have Not Why this growing attention to foreign metal supplies? U. S. capacity to produce raw materials has not kept up with demand created by industrial expansion, was the answer given by John D. Small, Munitions Board chairman, to the National Foreign Trade Conference last week. Today foreign sources supply our total requirements for 36 metals, in the first half of this century the nation has faded fast in supplying its own raw materials. While in 1900 we exported 15 per cent of the gross value of our material needs, we imported 9 per cent in 1950, said Mr. Small.

These abstractions have practical implications for metals users and producers. If metals were free-traded, prices would go down, but so would domestic mines with low grade deposits. Mechanization in the U. S. makes up in increased production for the low wage rates paid abroad, say free traders. A big flaw in their plan—how can the U. S. get the metals needed for industry in a shooting war from far-flung corners of the earth? A sick domestic industry might need a long period of convalescence before it could be of any real help—and that might be too late.

Down To Earth Tariffs are now in force in varying degrees on all major metals but copper, and that one will go back on early next year unless Congress acts. Removal of tariffs on lead and zinc now would be insult to injury received from Britain's lead dumping spree. Demand is again strong, but there's plenty of metal available. A sizable tonnage from Britain's Ministry of Materials is destined for the U. S. stockpile.

Zinc hasn't felt the full blow that lead did, and zinc will be free-traded in Britain in about five weeks. Nearly 200,000 tons of zinc are held by the MOM whereas about 100,000 tons of lead were on hand when it was freed. Unless caution prevails, a slump in zinc is inevitable. If duty came off aluminum imports, domestic producers would be at a distinct disadvantage because of higher power costs, but about 75 per cent of all aluminum comes from this country. Copper wouldn't be hurt badly, its present price is two-thirds of the going foreign rate and in a free market could hold its own.

Olin Gets the Nod

Olin Industries Inc., East Alton, Ill., will go into aluminum production and will be the major new participant in the much-discussed, 200,000-ton, aluminum expansion program. Speculation has been rampant for months on what company would get the nod. Other new firms may still enter the field, but Olin will become the fourth important basic producer. It won two certificates of necessity for facilities to produce 110,000 tons primary aluminum annually, and for fabricating facilities to produce 40,000 tons of wide high-strength aluminum sheets and 12,000 to 15,000 tons of extrusions. Total cost will be $168.8 million.

Other companies are also participating in the expansion of aluminum fabricating facilities. Fairmont Aluminum Co., Fairmont, W. Va., will build a $32.5 million aluminum sheet and plate plant to turn out 72,000 tons yearly.

A certificate of necessity allows fast tax write-off of 50 per cent of the cost.

Magnesium Takes to Air

The Air Force is using magnesium sheet metal faricated parts and assemblies in growing amounts, as this new turret enclosure and tail cone on a Boeing B-47 bomber shows. Made almost entirely of magnesium, the installations are the product of Brooks & Perkins Inc., Detroit. They are mounted in the aft section of bombers in connection with General Electric Co.'s fire control installations

Tin: 60% from Private Traders?

A minimum of 60 per cent of industry's 1953 tin requirements will come from private traders, rather than from RFC, a prominent tin trader estimates.

As things stand now the market is still firm after the immediate slump following resumption of free trading because the government has about 90 per cent of the nation's 1952 imports cornered. RFC has contracted for roughly 90,000 tons this year, including concentrates. Holding up establishment of a free market entirely are firm contracts RFC holds for Belgian Congo and Indonesian tin.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c; 88-10-2 (No. 215) 40.00c; 80-10-10 (No. 305) 33.00c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 12.50c; brass special 12.75c; intermediate 13.00c; East St. Louis high grade 13.85c, delivered.

Lead: Common 14.05c; chemical 14.15c; corroding 14.15c; St. Louis.

Primary Aluminum: 99% plus, ingots 20.00c; pigs 19.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades notch bars, granulated or shot: grade 1, 18.80c; grade 2, 18.60c; grade 3, 18.40c; grade 4, 18.20c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American 99.99.8% and over but not meeting specifications below 34.50c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 35.00c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs 59.15c; "X" nickel shot 60.15c; "F" nickel shot or ingots for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market spot New York $200@$203, nominal, per 76-lb flask.

Beryllium Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms $2.00 del; special or patented shapes $2.15.

Cobalt: 97.99% $2.40 per lb for 500 lb (keg); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury $35 per ounce.

Silver: Open market, New York 83.25c per oz.

Platinum: $90@$93 per ounce from refineries.

Palladium: $23@$24 per troy ounce.

Iridium: $175@$185 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective June 1, 1952)

Sheet: Copper 45.52; yellow brass 40.17; commercial bronze 90% 43.15; 95% 44.38; red brass 85% 42.10; 80% 42.34; best quality 41.35; nickel silver 18% 55.08; phosphor bronze grade A, 5% 64.71.

Rod: Copper, hot-rolled 41.37, cold-drawn 42.62; yellow brass free cutting 33.85; commercial bronze 95% 44.84, 90% 44.07, red brass 85% 42.79, 80% 42.03.

Seamless Tubing: Copper 45.56; yellow brass 42.18; commercial bronze 90% 47.04; red brass 85% 46.01.

Wire: Yellow brass 40.46; commercial bronze 95% 45.44, 90% 44.67; red brass, 85% 44.39, 80% 42.63; best quality brass 41.64.

(Base prices, effective July 1, 1952)

Copper Wire: Bare, soft, f.o.b. eastern mills (carload lots) 32.795; 30,000 lb lots 32.92; l.c.l. 33.42. Weatherproof 100,000 lb 33.80; 30,000 lb 33.85; l.c.l. 34.35. Magnet wire, del. 15,000 lb or more 38.25; l.c.l. 39.50.

ALUMINUM

(10,000 lb base, freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders. Effective Aug. 4, 1952.)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, Sheet In.	Inc	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48		32.6		
0.135-0.096	12-48		32.1		
0.095-0.077	12-48		32.8	30.6	34.9
0.076-0.061	12-48		33.4	30.8	35.1
0.060-0.048	12-48		33.7	31.0	35.4
0.047-0.038	12-48		34.1	31.2	35.7
0.037-0.030	12-48		34.5	31.7	36.3
0.029-0.024	12-48		35.1	32.0	36.8
0.023-0.019	12-36		35.7	32.7	37.5
0.018-0.017	12-36		36.4	33.3	38.4
0.016-0.015	12-36		37.3	34.0	39.5
0.014	12-24		38.3	35.0	40.8
0.013-0.012	12-24		39.3	35.7	41.7
0.011	12-24		40.3	36.8	43.3
0.010-0.0095	12-24		41.4	37.9	44.5
0.009-0.0085	12-24		42.6	39.1	45.6
0.008-0.0075	12-24		44.0	40.3	48.4
0.007	12-18		45.5	41.7	50.6
0.006	12-18		47.0	45.1	55.4

* Lengths 72 to 180 inches. † Maximum diameter 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	Round R317-T4	Round 17S-T4	Hexagonal R317-T4	Hexagonal 17S-T4
0.125	54.6			
0.156-0.0188	46.2			
0.219-0.313	43.6			
0.375	42.0		48.3	50.4
0.406	42.0			
0.438	42.0		48.3	50.4
0.469	42.0			
0.500	42.0		48.3	50.4
0.531	42.0			
0.563	42.0			47.3
0.594	42.0			
0.625	42.0		45.7	47.3
0.688	42.0			47.3
0.750-1.000	41.0		43.1	44.6
1.063	41.0			43.1
1.125-1.500	39.4		41.5	43.1
1.563	38.9			
1.625	38.3			41.5
1.688-2.000	38.3			

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $19.50 per cwt; add 50c cwt 100 sq ft to 140 sq ft. Pipe: Full coils $19.50 per cwt. Traps and bends: List prices plus 43%.

ZINC

Sheets 23.00c, f.o.b. mill; 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 20.75-21.75c; over 12-in., 22.75-23.75c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 60.50c. Strip, cold-rolled, 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds: 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb 10,000 lb and over, f.o.b. mill) Sheets $15, sheared mill plate $12; strip, $15; wire $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb 75.50c; 3000 to 10,000 lb 76.50c; 500 to 3000 lb 77.50c; 100 to 500 lb 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 300 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 300 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers 86.7c; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb 69c; 2000 to 9000 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.42; 500 to 999 lb, $1.425; 200 to 499 lb, $1.43; less than 200 lb $1.445. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.50c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl 98.5c; 100 lb kegs 99.5c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. Bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group I: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50. Mixed plant scrap: Copper-free solids, 10.00; dural type, 9.00. Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Lead: Heavy 11.25-11.75; battery plates 6.25-6.50; linotype and stereotype 13.00-13.50; electrotype 11.25-11.50; mixed babbitt 13.75-14.00.

Zinc: Old zinc 5.50-6.00; new die cast scrap, 5.50-6.00; old die cast scrap, 4.00-4.50.

DAILY PRICE RECORD

1953	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Nov. 20	24.50	14.05	12.50	121.50	20.00	34.50	56.50	83.25
Nov. 12-19	24.50	14.50	12.50	121.50	20.00	34.50	56.50	83.25
Nov. 11	24.50	14.00	12.50	121.50	20.00	34.50	56.50	83.25
Nov. 3-10	24.50	13.80	12.50	121.50	20.00	34.50	56.50	83.25
Nov. 1	24.50	13.30	12.50	121.50	20.00	39.00	56.50	83.25
Oct. 23-31	24.50	13.30	12.50	121.50	20.00	39.00	56.50	83.25
Oct. 22	24.50	13.50	13.50	121.50	20.00	39.00	56.50	83.25
Oct. 14-21	24.50	13.80	13.50	121.50	20.00	39.00	56.50	83.25
Oct. 8-13	24.50	14.80	13.50	121.50	20.00	39.00	56.50	83.25
Oct. Avg.	24.50	14.226	13.259	121.50	20.00	39.00	56.50	83.25
Sept. Avg.	24.50	15.50	13.99	121.50	20.00	39.00	56.50	83.25
Aug. Avg.	24.50	15.50	14.067	121.50	19.925	39.00	56.50	83.25
July Avg.	24.50	15.00	12.50	121.50	19.00	39.00	56.50	82.885
June Avg.	24.50	15.06	15.74	121.50	19.00	39.00	56.50	82.75
Nov. 1951 Avg.	24.50	19.80	19.50	103.00	19.00	44.56	56.50	88.00
Nov. 1947 Avg.	24.50	14.825	10.50	80.00	15.00	33.00	35.00	74.625

NOTE: Copper: Electrolytic, del. Conn. Valley. Lead: common grade, del. St. Louis; Zinc, prime western, E. St. Louis. Tin, Straits, del. New York. Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex. Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Wire . . .

Wire Prices, Page 153

New York—Demand for high carbon specialties is heavier. First quarter schedules are filling, but there are openings for most products. Valve spring wire, heading stock and spring requirements are up. Lagging in demand are weaving wire and various grades used by the textile industry.

Cleveland — Noticeable pickup in demand for manufacturers' wire is reported, order volume for November to date being above that for October. Volume in the merchant products, such as nails, bale ties and fencing, however, is down. Wiremakers' backlogs over-all are sufficient to support high level opertions through first quarter.

Sheets, Strip . . .

Sheet and Strip Prices, Page 151 & 152

Cleveland—Sheet mills are heavily booked for first quarter on defense tonnage and the load is not likely to taper much over the next six months. Carryover from fourth to first quarter will be heavy, and will take precedence over first quarter commitments. Whether the first quarter tonnage in turn will bump second quarter commitments is uncertain, but sellers here say that, as of the moment, it looks as though sheet supply conditions will be tight right into third quarter next year despite increased capacity. Indicative of the tight supply situation prevailing a midwest tank manufacturer is having difficulty placing its first quarter tickets for hot-rolled sheets.

Boston—Decontrol of one flat-rolled product, straight chromium stainless, soon corrected shortages. Consumers are well supplied with that grade and both mills and warehouses are trying to sell more. Quite another story covers nickel stainless. Shortages in nickel limit use from finished product to plating. Many users of nickel stainless substituted straight chromium reluctantly. For some metalworking industries it is not acceptable, dairy equipment for one. Mild improvement in narrow cold strip holds, but first quarter capacity has not been entirely taken. Where cold-rolled sheet fabricators have increased allotments, difficulty is experienced in getting this tonnage on mill schedules.

New York—Only in hot strip and some specialties are sheet sellers able to offer much in the way of nearby deliveries. Mills have nothing left for this year and on promises for January much depends on mill limitations. Straight chrome sheets and some low silicons are among items in relatively easy supply. Hot and cold-rolled sheets are in tight supply; also galvanized sheets, enameling stock and high silicon material.

Philadelphia—A tight market in hot and cold-rolled sheets is expected throughout first quarter, possibly well into the second three months of 1953. Some consumers haven't been able to place all fourth quarter tickets. Fairly easy spot in the carbon grades is hot-rolled strip. Some sellers promise delivery early in first quarter.

Pittsburgh—One producer here says the supply of sheet and strip will be eased by a more realistic outlook on the part of those con-

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stomers holding A and B tickets. Many of them received priorities on the basis of inflated programs, and inventories are being treated. Mills are currently busy with fourth quarter tickets and see little relief or ticketless buyers before end of February.

Chicago—Sheetmakers are experiencing considerable pressure from consumers for increased quantities of sheets in all categories for delivery between now and end of first quarter. Despite increasing steel output little of the additional demand can be accommodated. Hot-rolled sheets are tighter than cold-rolled, the wider, heavy gages being particularly short. Auto framemakers are among aggressive seekers for more generous supplies.

St. Louis—Increased pressure for cold-rolled sheet deliveries is being put on mills by manufacturers of consumer hard goods. Makers of refrigerators and smaller electrical appliances have exhausted their stocks of both sheet and finished goods. Some are selling directly from the production line. The auto industry, which normally buys no sheets in this district is making frequent inquiries for flat rolled products and conversion ingots. Farm implement manufacturers also are seeking suppliers here. An open-hearth cave in at Granite City Steel last week cut sheet output.

Birmingham—Outlook for any appreciable increase in available tonnage of cold-rolled sheets is not encouraging. District mills will carry over considerable backlog.

Los Angeles—Delayed effects of the steel strike are intensifying. Columbia-Geneva Steel Division, U. S. Steel Co., concerned only with working off carryover, will be unable to accept new orders for sheets in first quarter.

Steel Bars . . .

Bar Prices, Page 151

Chicago—Large diameter quality bars and forging billets from 1-in. diameter up are about the tightest of all steel products. Impact of the military theil and high-rated defense programs falls heavily on these items. Automobile industry is beginning to feel this one product is likely to be the main stumbling block to attainment of its first quarter production goal. Bar consumption is rising now that strike at International Harvester Co. plants is ended.

Boston—Bolt shops stand to gain from increased allotments of carbon bars for first quarter. While supplemental tonnage is for sizes 1-in. and under, some easing in smaller sizes, coupled with the fact bulk of production is within this range, points to most volume being placed. Military set-asides also center heavily in heavier sizes. Demand for low alloy bars is relatively strong, also ground stock and other specialties. Die-rolled stock orders take up limited capacity. Tonnage-wise, large bars account for a large part of forge shop requirements but a surge in orders for bars from 1½-in. to 2½-in. is noted.

Philadelphia—First quarter tickets that have been accepted by bar mills for February rolling can be displaced by fourth quarter tickets, if action is taken between Nov. 17 and 28. In bars, as in most of the major products, however, relatively few first quarter tickets have been accepted for February.

Pittsburgh—While not yet in full production, Jones & Laughlin's new bar mill is making itself felt among consumers in the Pittsburgh area. Full output will not be reached until second quarter. Currently, large diameters are the bottleneck for many consumers.

Cleveland—Bar sellers anticipate no easing in over-all supply conditions at least before second quarter next year. Small sizes are more readily available but large-size bars, if anything, are in tighter supply than they were some time back. Expectations are no marked easing will develop in the larger sizes until such time as military requirements taper off.

Tubular Goods . . .

Tubular Goods Prices, Page 155

Pueblo, Colo.—Construction of Colorado Fuel & Iron Corp.'s $30 million seamless tube mill is being rushed to completion, scheduled for mid-1953.

Plates . . .

Plate Prices, Page 151

Boston—Where plate shops placed fourth quarter tickets with warehouses to maintain operations they now lack sufficient authorizations for early first quarter mill schedules. Before regular first quarter allotments are processed inventories will be lowered. Included in first quarter set-aside is considerable light armor plate. Most armor plate requirements are for rolled material rather than heavy cast. Placement of 4400 tons for fuel storage tanks practically completes plate procurement for an increase in storage capacity.

New York—District plate consumers are experiencing continued difficulty in obtaining sheared plate in all thicknesses and particularly heavier gages, ½-in. and up. Fabricators are having trouble placing fourth quarter tickets for non-defense work. The only promise they can obtain on new tonnage for first quarter is March and only a limited tonnage then as producers generally are counting on a big carry-over at beginning of the year.

Philadelphia—Plate producers have little left in first quarter for other than high-rated orders protected by set-asides. Such nondefense business as has been placed against first quarter tickets is scheduled largely for shipment in March. Some sellers look for a possible slowing up in second quarter.

Pittsburgh—Heavy demand for steel plates is predicted through second quarter. Heavy consumers having difficulty maintaining production are carbuilders and press manufacturers. The pipe line program will take up any slack in demand that may develop after second quarter.

Birmingham—Plate producers are not able to take care of all requirements and will be in no better position in first quarter.

Seattle—One thousand tons or more of plates are involved for pen-

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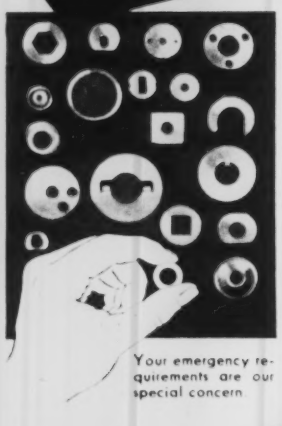

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Structural Shapes . . .

Structural Shape Prices, Page 151

Boston—New England contractors have placed 3875 tons, New York state thruway bridges, but volume being estimated in this area is at lowest point this year. Small-tonnage lots are made up largely for schools, district shops booking most of this tonnage. For the heavy press program, Wyman-Gordon Co., Worcester, 13,500 tons of the 15,000 tons required have been delivered or erected. More than 713 carloads of structural steel will be required, fabricated by Bethlehem Steel Co., Bethlehem, Pa.

New York—Although commercial work is relatively quiet due to governmental restrictions, a fair amount of public work is active. Bids will be taken Dec. 15 on a section of the New York state thruway, involving superstructure of the Tappan Zee bridge, estimated to cost $35,764,000, and to require between 60,000 and 65,000 tons.

Philadelphia—Structural inquiry is more active though limited, and chiefly public work. Fabricating shops are operating on substantial backlogs and are making somewhat better headway as a result of improved shape deliveries.

Pittsburgh—Wide flange beams are in shortest supply and larger sizes will be in short supply even after expected first quarter easing.

Seattle—Fabricators' order backlogs have declined markedly the last 60 days. Bids are in at Hanford for 1300 tons of shapes and awards have been made for steel involved in classified jobs in Washington state and Alaska. While wide flange sections are not as tight as they were, plants find it difficult to place first quarter orders.

Pig Iron . . .

Pig Iron Prices, Page 150

New York—Pig iron supply continues to improve. Foundries are not operating too actively and, further, with the 30-day limitation on inventories consumer interest is not what it ordinarily would be. Some foreign offerings are noted at the lowest prices in many months. Australian iron for January shipment is offered at around $60 c.i.f. East Coast points. This applies to basic, foundry and malleable, all machine cast. Some Austrian high silicon iron is offered at $58 on cars, Baltimore. Spanish bessemer is quoted at $70 c.i.f., eastern seaboard. A little Norwegian iron is said to be available around $61 to $62, c.i.f.

Boston—Operators hope to resume production at the Mystic furnace, Everett, Mass., by the first of next year. If repairs are completed by that time, no iron shortage confronts district consumers. Shipments from reserve stocks and from outside furnaces should meet requirements of users of foundry grades, since the larger ones are operating below capacity.

Philadelphia—Foundry iron supply is keeping pace with demand, partly because of restricted operations at a number of foundries, particularly jobbing shops, and to im-

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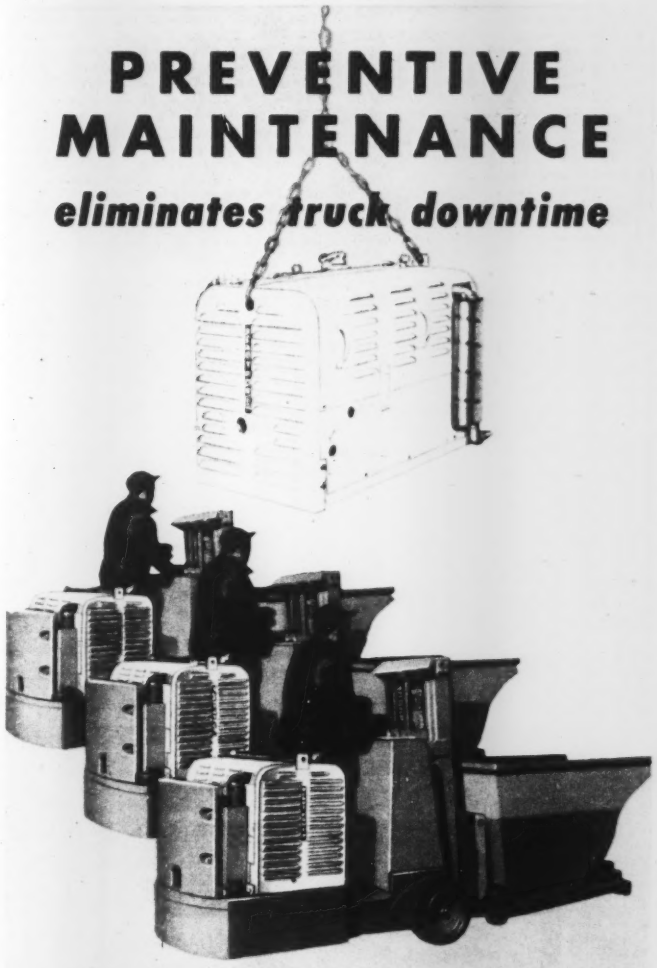
eliminates truck downtime



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prove movement of iron from outside the district.

Pittsburgh—Pig iron supply is just about in balance with demand. Producers are able to take care of customers' orders promptly. Activity among smaller foundries is especially brisk. Production among larger plants is below normal.

Cleveland—Merchant iron is moving steadily into consumption but producers are under noticeably less pressure for shipments than some months ago. This is a reflection of government inventory limitations and sluggish operations at some foundries. Shops on machine tool castings and other heavy jobbing plants reportedly are less active. On the other hand, a slight pickup in activity is underway at the lighter castings plants on civilian work.

Chicago—Majority of gray iron and malleable foundries are operating 75 to 80 per cent but there is a pessimistic note because order backlogs are mainly of short-term character.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 155

New York—Oven coke producers early last week were advised of two changes in regulations by the Office of Price Stabilization. Effective Nov. 12, amendment 12 to supplementary regulation 13 extended for 15 days authority given coke producers for retroactive pricing of coke back to Sept. 29. Subsequently, amendment 13 to supplementary regulation 13, approving an increase in prices in oven coke, was signed Nov. 18 by the director of price stabilization with the effective date of the increases to be Nov. 21. As this latter date approached there was speculation as to what increase would be approved and once the actual increases were named, what the position of coke producers would be in making them retroactive.

Cleveland—Pending final determination of the coal wage dispute cokemakers are marking time with respect to prices. Expectations are should a coal price increase be allowed to compensate for the miners' wage hike, this, in due time, will be reflected in an increase in coke prices.

Scrap . . .

Scrap Prices, Page 158

Cleveland—Scrap continues to move steadily from dealers' yards to the steel mills and foundries. As a result, yard stocks are low despite a good flow of material from manufacturing plants, and except in cast grades, tonnage is not hanging over the market in any volume to contribute to price weakness. Except for a slight slowing down in the movement of electric furnace grades to a steelmaker in the Valley the market for steelmaking grades is virtually unchanged from recent weeks. Quality cast scrap is moving fairly well, but unstripped motor blocks attract little interest. Some pickup in operations at foundries on light castings is noted, but, at the same time, shops on machine tool and other heavy castings are reported showing signs of lessening activity.

Detroit—Pressure for steelmaking scrap is heavy, although quality is being watched rather carefully. Dealers' inventories are dropping, the result of slightly smaller collections from some plants. The trade is not seriously concerned about a shortage this winter. Demand from foundries is increasing, although few foundries are hungry for scrap. Scattered sales are being made at ceiling but the market as a whole is not up to that level.

Boston—Although foundry steel scrap prices are slightly under ceiling levels, all open-hearth grades are quoted at maximums. Shipments are being received at a rate to maintain comfortable inventories. Cast grades are the weak spot with buying light and prices ranging from $2 to $10 below ceilings.

New York—Scrap brokers have dropped their buying prices on unstripped motor blocks about $5 per ton to $32-$33. They also have dropped their buying price $1 a ton on cupola cast to a spread of $41-$42. Steel mill grades are firm.

Buffalo—Mills' reserve stocks of scrap are bulging but no weakness is apparent in steelmaking grades. New business is being done at ceilings. The second largest consumer here has extended an embargo on shipments into the eighth week. Cast supplies are plentiful with prices quoted $2 to $3 below ceilings.

Philadelphia—Some district mills are running a bit low on scrap and are pushing for tonnage. Some yards are shipping steelmaking grades as fast as received and prepared. There is no threat of an acute shortage, however. If necessary, plants can reach out farther for material. Some mills are in comfortable inventory position. Cast supply is on the easy side. No. 1 cupola is still under ceiling, and unstripped motor blocks are nominally lower at $40, delivered. Alloy scrap is easier. Chrome turnings, of the type used for producing bearing steel, are no longer offered at a premium of $1 per ton.

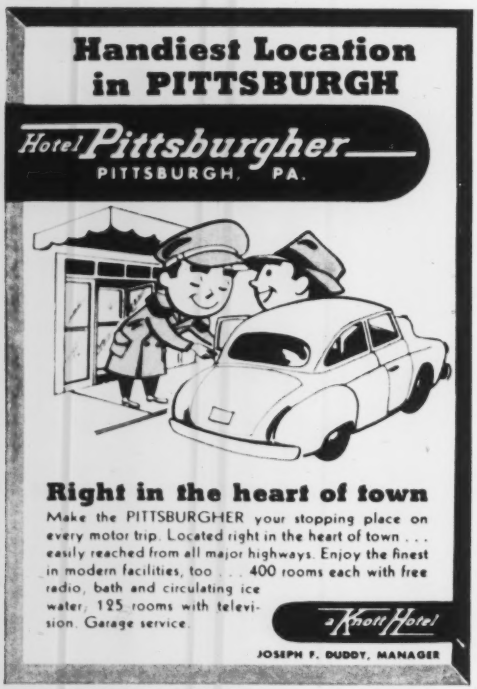
Pittsburgh—Sluggish activity characterizes the scrap market. Large mills have ample supplies and are not buying in quantity. Smaller mills and foundries are in need of railroad specialties, but there is not enough to supply demand.

Chicago—Although steelmaking has climbed to an all-time high, scrap inventories have not suffered in the process. Mills do not expect to face either a scrap or iron ore shortage of any consequence this winter. Blast furnace scrap is listless and foundry grades are depressed.

St. Louis—Heavy melting scrap market remains quiet. Late open weather has put mills in a favorable stock position; at least one will place no orders in November. Mills are in no hurry for delivery on back orders and most brokers are willing to hold off for tax purposes. Open-hearth scrap prices are firm, but cast quotes are nominal with few takers. Dealers are hopeful current new rail deliveries will speed up maintenance and boost scrap rail offerings.

Los Angeles—Mills are buying steadily but are showing more restraint in purchasing. Bids are being taken for Korean battlefield scrap. Cast grades are weaker.

San Francisco—Scrap is moving steadily. Lower mill offers now are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being made as result of surpluses here and there in some grades. Survey reveals no big build-up of supplies in dealers' yards.

Seattle—Heavy melting scrap is firm at ceiling levels but bundles are $5 below maximum. The supply situation is complicated by the opening of the Seidelhuber mill. Ample supplies are reported in California from which area the Northwest may have to draw material, paying additional freight. Large scrap dealers anticipate no repetition of last winter's extreme shortage. Japanese buyers are showing interest in West Coast scrap and would buy in volume if export permits were available.

Iron Ore . . .

Iron Ore Prices, Page 157

Cleveland—Indications are the lake iron ore shipment goal of 75 million tons for the 1952 season will be surpassed. Aided by favorable weather the fleet has been able to maintain shipments at record-breaking pace all through the fall, making up a substantial part of the shipment loss experienced during the June-July steel strike. During the latest week of record, that ended Nov. 17, shipments from upper lake ports totaled 2,270,792 tons, bringing the cumulative movement for the 1952 season to date to 71,453,137 gross tons only 14,528,052 tons under the total moved in the like period of the 1951 season.

Consumption of Lake Superior iron ore in October totaled 8,048,031 gross tons, an increase compared with 7,659,099 in September and 7,749,424 in October a year ago. Consumption for the year to date totals 62,224,228 gross tons, comparing with 74,106,111 in the like period last year.

Stocks of ore at furnaces (U. S. and Canada) and on Lake Erie docks on Nov. 1 totaled 47,839,049 gross tons. This compares with 41,532,214 tons on Oct. 1, and with 50,229,034 tons on Nov. 1, 1951. Of 199 blast furnaces in the U. S. and Canada, on Nov. 1 only 7 were idle.

Aided by favorable weather, Pittsburgh Steamship Division, U. S. Steel Co., established a new all-time record for a week in November when its 64 vessels loaded 818,686 gross tons of iron ore during the week ended Nov. 17. The previous record was 692,754 tons, set in the week ended Nov. 14, 1948.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 155

Cleveland—Bolt and nut producers are adding 2.2 per cent increase to their invoices to reflect pass-through costs allowed on raw materials by the Office of Price Stabilization. The increase became effective Nov. 12. Published discount lists are unchanged. Similarly, a pass-through increase is being effected on screws. Demand for fasteners on civilian goods account is reported improving, reflecting pickup in activity by appliance manufacturers, such as stoves and refrigerators. At the same time automotive demand is described as comfortable. Fastener makers' steel supply is improving in some directions. Heading wire is noticeably easier as is bar stock under $\frac{5}{8}$-in. Supply conditions in bars $\frac{5}{8}$-in. and up are described as tough with the

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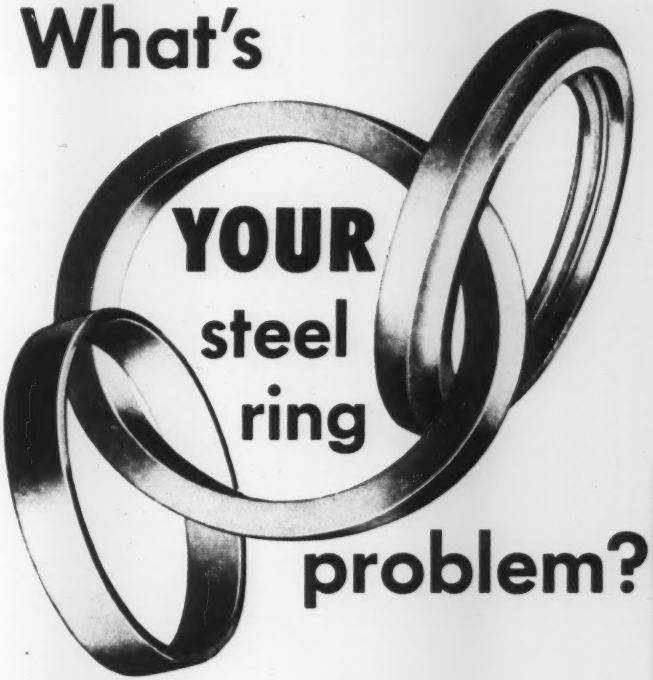

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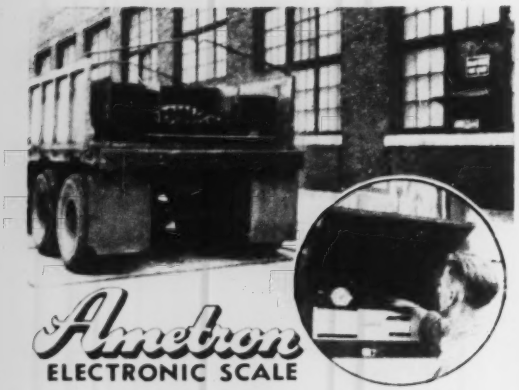

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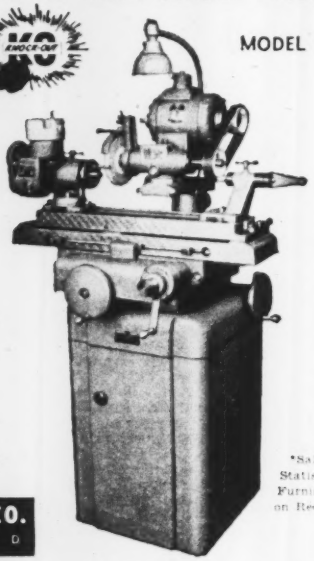

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military fuze program a factor for shortage.

New York—Port of New York Authority has awarded a contract to the Pittsburgh Screw & Bolt Corp., Pittsburgh, for 1,192,000 nuts, bolts and washers required for fastening 2625 cast iron rings which will form the outer shell of the under-river segment of the third Lincoln tunnel tube.

Pittsburgh—Supply of steel for conversion into bolts and nuts has improved, but not sufficiently to permit production of a balanced range of sizes. Producers shipped more tonnage during October than in any month since start of the steel strike.

Warehouse . . .

Warehouse Prices, Page 157

New York—Warehouse steel receipts are at pre-strike levels, but demand operates against building of inventories except in a limited number of products. Heavier hot-rolled carbon products, structurals, plates and bars move out as fast as received. The same holds for cold-finished bars and cold-rolled sheets, but supplies of heavier gages of hot-rolled sheets are building up. Most distributors have good stocks of straight chromium stainless to meet strong demand.

Philadelphia—Steel distributors are making little headway in building up inventories of major products. Shapes, plates and bars are moving out as fast as they are received. Hot and cold-rolled carbon sheets are moving briskly.

Cleveland—Warehouse operators are rebuilding their inventories slowly. Generally, they do not expect balanced stocks until well into 1953. Receipts from the mills have been steady in recent months, however, and except for large-size bars, heavy plates and certain structural sections supply conditions are noticeably improved as contrasted with a few months back.

Chicago—Heavy warehouse demand for hot and cold-finished bars, hot and cold-rolled sheets, plates and structurals reflects the extreme shortage of these products from mill sources. Manufacturers of consumer goods appear determined to produce as much as they can as fast as they can.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

4800 tons, municipal pier 57, Hudson river, New York, to Harris Structural Steel Co., that city.

1500 tons, bridges, New York State thruway: Mohawk sections 6 and 7, Oneida county, to American Bridge Co., Pittsburgh; Arute Bros. Inc., New Britain, Conn., general contractor.

1275 tons, bridges, New York State thruway: Catskill section 6, Greene county, to American Bridge Co., Pittsburgh; A. I. Savin Construction Corp., East Hartford, Conn., general contractor.

1100 tons, bridges, New York State thruway: Mohawk sections 3 and 4, Madison-Oneida counties to Harris Structural Steel Co., New York; A. I. Savin Construction Corp., East Hartford, Conn., general contractor.

700 tons, plant additions, Southern Paper Board Corp., Savannah, Ga., to O'Neil Co., Birmingham. Daniel Construction Co., Greenville, S. C., general contractor.

500 tons, classified Washington state project, to Pacific Car & Foundry Co., Seattle.

250 tons, classified Alaska installation, to Pacific Car & Foundry Co., Seattle.

150 tons, church and monastery, St. Anthony's Shrine, Boston, to West End Iron Works, Cambridge, Mass.; Thomas O'Connor & Co., Inc., Cambridge, general contractor.

125 tons, civil engineering building, Worcester Polytechnic Institute, Worcester, Mass., to Bethlehem Steel Co.; R. I. Whipple Co., Worcester, general contractor; also 50 tons reinforcing bars to Bethlehem Steel Co.

100 tons, elementary school, Flagg street, Worcester, to Stafford Iron Works, Worcester, and Tucker & Fox Co., Belton Granger Construction Co., Worcester, general contractor.

STRUCTURAL STEEL PENDING

60,000 to 65,000 tons, bridge, New York state thruway, bids Dec. 15.

2720 tons, including 420 tons low alloy, Wabash Memorial bridge, Wabash river, near Mt. Vernon, Ind.; bids Dec. 16; Indiana State Toll Bridge Commission, Indianapolis.

1400 tons, Army depot, Letterkenny, Pa.; bids Nov. 28.

1200 tons, Westchester by-pass, Pennsylvania, bids Dec. 19.

1236 tons, state bridge work, Chester county, Pennsylvania; bids Dec. 19; also a substantial quantity of steel beam piles.

776 tons, state bridge work, Allegheny county, Pa.; bids Dec. 19.

750 tons, Market St. subway extension, Philadelphia; bids Dec. 2.

425 tons, Garden State thruway, contract 5, New Jersey, Frederick Snare Inc., New York, awarded general contract.

400 tons, tunnel supports, 3.3 mile, 9.5-ft. diameter Gateway tunnel, Weber Basin project, Ogden Construction Co., Ogden, Utah, low to Bureau of Reclamation, Denver, $2,488,613.

370 tons, floor replacement, Frankford, Pa., arsenal; bids closed.

245 tons, state bridge, Arundel county, Maryland, Wright Contracting Co., Atlanta, Ga., low on general contract.

125 tons, Metropolitan office building, Reading, Pa., Sordoni Construction Co., Wilkes-Barre, Pa., awarded general contract.

100 tons, Acme supermarket, Germantown Ave., Philadelphia; bids closed Nov. 17.

100 tons, three road bridges in Alaska; bids in to Bureau of Roads.

Untated tonnage, 20 spans of state bridge work over Potomac river, Brunswick, Md.; bids Dec. 16.

REINFORCING BARS . . .

REINFORCING BARS PLACED

200 tons, plant addition, Southern Paper Board Co., Savannah, Ga., to Hall Steel Co., Atlanta; Daniel Construction Co., Greenville, S. C., general contractor.

145 tons, field quarters, Ladd field, Alaska, to Ryerson Steel Co., Seattle; Kuney-Johnson Co., general contractor.

REINFORCING BARS PENDING

785 tons, state bridge work, Chester county, Pennsylvania; bids Dec. 19.

667 tons, state bridge work, Gloucester county, N. J.; bids Dec. 9.

400 tons, Wabash Memorial bridge, Wabash river, near Mt. Vernon, Ind.; bids Dec. 16; Indiana State Toll Bridge Commission, Indianapolis; also 12,000 lineal feet steel piling.

350 tons, Sly Park dam, Central Valley project, near Placerville, Calif.; bids about Jan. 15, Bureau of Reclamation, Denver.

300 tons, five dormitories, Eielson air field, Alaska; general contract to Kuney-Johnson Co., Seattle, low $2,515,223; bids opened by U. S. Engineer, Oct. 3.

130 tons, state bridge work, Allegheny county, Pa.; bids Dec. 19.

RAILS, CARS . . .

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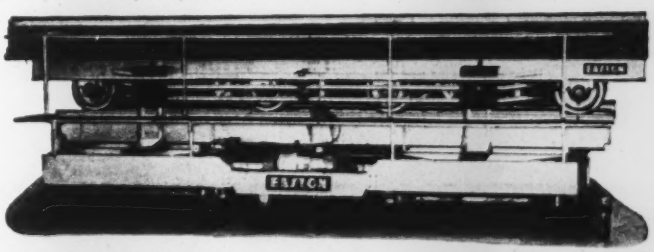

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U. S. Pipe Forms New Division

Sloss-Sheffield Steel & Iron Co., Birmingham, is now the Sloss-Sheffield Steel & Iron Division, U. S. Pipe & Foundry Co., East Burlington, N. J. This action was taken by stockholders recently when they voted for the merger. U. S. Pipe acquired a majority of the Sloss-Sheffield stock in 1942.

Metal Stamping Firms Merge

National Stamping Co., Detroit, will merge with Mt. Clemens Metal Products Co., Mt. Clemens, Mich., subject to approval by stockholders of the companies.

Cockshutt To Boost Production

Brantford Division, Cockshutt Aircraft Ltd., a subsidiary of Cockshutt Farm Equipment Ltd., Brantford, Ont. is being transferred to the Renfrew, Ont., plant to centralize production of jet aircraft parts under contract to A. V. Roe Co. The Brantford plant will be used by the parent company to enlarge its tractor production program.

Trenkamp Heads Gray Iron Group

Gray Iron Founders' Society Inc., Cleveland, elected the following officers: President, H. J. Trenkamp, Ohio Foundry Co., Cleveland; vice president, T. I. Curtin Jr., Waltham Foundry Co., Waltham, Mass.; secretary, C. H. Ker, Dalton Foundries Inc., Warsaw, Ind., treasurer, W. O. Larson, W. O. Larson Foundry Co., Grafton, O.

Cerium Metals Names Representative

Cerium Metals Corp., New York, appointed Ohio Ferro-Alloys Corp., Canton, O., as its exclusive sales representative to the iron and steel industry. The Cerium products, which will supplement the line of ferroalloy products manufactured by Ohio Ferro-Alloy Corp., include: Mischmetal, cerium and rare earth alloys and cerium master alloys containing aluminum, magnesium, manganese, silicon and other elements.

O'Neal Enlarges Office Building

O'Neal Steel Co., Birmingham, is expanding its office building. The present two-story building is being doubled in size and modernized.

Central Foundry Gets Nine Presses

Lake Erie Engineering Corp., Buffalo, shipped the last of nine huge hydraulic presses for making steel artillery shells to Central Foundry Co.'s property in Holt, Ala. The foundry will make shells by the cold extrusion process.

Armco Organizes Sales Department

Armco Steel Corp., Middletown, O., organized a coal and stone products sales department, headed by George C. Brecht, manager. The department will distribute coal, coke, coal chemicals, agricultural limestone, flux stone, whiting and crushed stone.

Lewis-Shepard Expands Facilities

Lewis-Shepard Products Inc., Watertown, Mass., is increasing by 50 per cent its tool room and machine shop capacities. This additional construction is in the final stages of completion.

Macauley Machinery Moves Offices

Macauley Machinery Co. moved its offices from Schenectady, N. Y., to the Sibley Tower building, Rochester, N. Y. The company represents Hartford Special Machinery Co., Hartford, Conn., in automatic drilling and tapping machinery.

Hayward-Tyler To Build Foundry

Hayward-Tyler Co., London, England, plans to erect a stainless steel foundry at Kitchener, Ont., within a year if it can obtain the desired site.

Aluminum Import Corp. Opens Office

Aluminum Import Corp., sales distributor in the United States for Aluminum Co. of Canada Ltd., opened an office at 20 N. Wacker Dr., Chicago. George R. Malby is the Chicago branch sales manager.

Bettinger Buys Enameling Process

Porcelain Enamel Products Corp., a division of Bettinger Corp., Waltham, Mass. acquired full ownership of Veos porcelain-on steel wall tile

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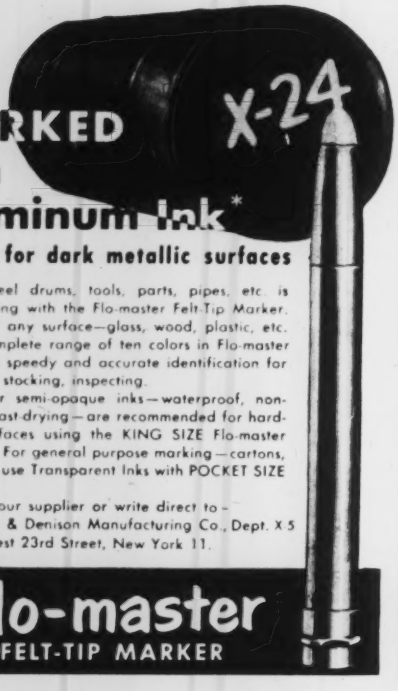

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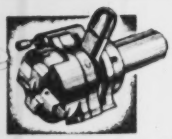

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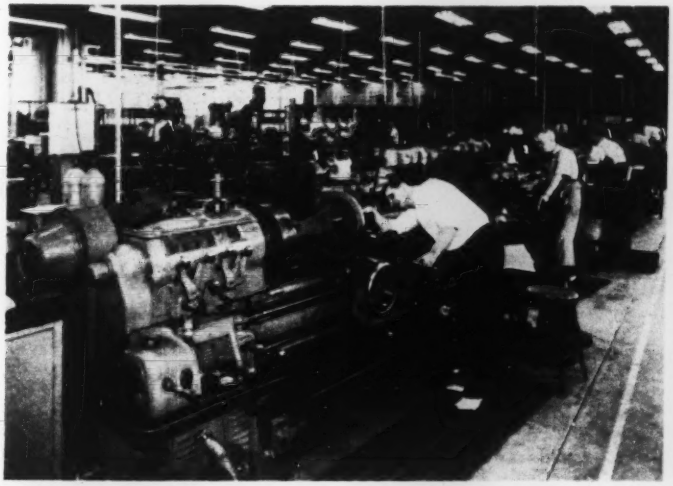

Precision Work Keeps Lathes Humming

Intricate parts of equipment pass through metalworking lathes at the Union, N. J., plant of Airco Equipment Mfg. Division of Air Reduction Co. Inc. The newly-opened facility manufactures many items including welding and cutting torches, tips and oxygen and acetylene manufacturing and distribution equipment. Precision machined parts include the Meehanite casting checked by the lathe in foreground. It will be the base for a centrifugal pump handling liquid oxygen

manufacturing process from Whirlpool Corp., St. Joseph, Mich. This porcelain wall tile is made by fusing vitreous porcelain enamel to tempered 26-gage steel. The Veos production lines were moved from Clyde, O., to a plant in Rehoboth, Mass.

Southwest Products Building Plant

Southwest Products Co., manufacturer of plain self-aligning bearings, rod end bearings and mechanical push-pull controls, will move into its new factory at 1705 S. Mountain Ave., Duarte, Calif., during the first week in January.

Aluminum Furniture Plant Reopens

Wood-Mor Products Co. Inc., Rochester, N. Y., reactivated its aluminum furniture manufacturing business after a suspension forced by lack of the metal.

Baker-Raulang Appoints Distributor

Baker-Raulang Co., Cleveland, appointed Industry Services Inc., New Orleans, as distributor of its industrial trucks in that area.

Fiberglas Firm Forms New Division

Owens-Corning Fiberglas Corp., Toledo, O., organized a Packaging Sales Division to bring about closer co-operation between its sales and research personnel on the one hand and manufacturers, fabricators and users of packaging materials on the other. Roy J. Black is manager of the new division.

Stanley Works Buys Vern Mfg. Co.

Stanley Works, New Britain, Conn., broadened its line of products by purchase of Vern Mfg. Co., Spotswood, N. J., producer of checking floor hinges and an automatic door operator. Equipment is being transferred to New Britain and a division organized for handling the new products.

Gould-National Moves Branch Office

Gould-National Batteries Inc. moved its northeastern area service and repair center from North Bergen, N. J., to larger quarters at 309 51st St., West New York, N. J. James E. Vaughan Jr. is manager of the new station.

Hubbellite Corp. Organized

Formation of a sales organization, Hubbellite Corp., with offices in the Farmers Bank building, Pittsburgh, was announced by P. A. Appleyard, president. Hubbellite, an inorganic copper-bearing floor surface cement, is manufactured by H. H. Robertson Co., Pittsburgh.

Shaw Heads Aluminum Distributors

National Association of Aluminum Distributors, Philadelphia, elected the following officers: President, Ralph W. Shaw Jr., A. R. Purdy Co., Lyndhurst, N. J.; vice presidents, Arthur W. Moody, Edgcomb Steel of New England Inc., Milford, Conn.,

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and Burton L. Wolff, Benjamin Wolff & Co., Chicago, treasurer; Marvin B. Marsh, Marsh Steel Corp., North Kansas City, Mo., secretary of the organization is R. Bruce Wall.

Aluminum Plant Expansion Started

Preliminary work has begun on expansion of Aluminum Co. of America's plant in Vancouver, Wash. The addition, to cost $1,217,500, will produce extruded sheets and other aluminum products.

Westinghouse Opens Two Plants

Production of electronic tubes has been started in two new manufacturing plants of the recently formed Westinghouse Electric Tube Division, Westinghouse Electric Corp., Pittsburgh. The plants, located in Elmira and Bath, N. Y., ultimately will attain volume production of virtually all types of radio and television power and receiving tubes, as well as numerous tube types for industrial and national defense purposes.

Little Forms International Unit

Arthur D. Little Inc., Cambridge, Mass., industrial consulting research firm, established an International Division headed by A. G. Haldane. E. P. Stevenson is president of the firm.

Mouldings Manufacturers Merge

Pyramid Mouldings Inc., Chicago, merged with Western Mouldings & Stampings Inc., Ontario, Calif. I. L. Reed, president of Pyramid Mouldings, announced that the subsidiary was renamed Western Mouldings Inc., will be operated as a division of the parent company and will be managed by Howard Burleson. Pyramid's western division is equipped to roll, bend and form mouldings in all metals.

Gibney-Coffman Moves Offices

Gibney-Coffman Corp., moved its offices to larger quarters at 2107 Kensington Ave., Buffalo. The company supplies castings, forgings, gears, steel fabrications, valves and fittings.

Adamas Carbide To Build Plant

Adamas Carbide Corp., Harrison, N. J., will construct in Kenilworth, N. J., a 20,000 sq ft plant for the production of tungsten carbide tool tips, dies, wear parts and powder.

Chicago Metals Merges with Hoyne

Chicago Metals Co. merged with Hoyne Iron & Steel Co., Chicago. The consolidated firm will operate under the name of the former company with J. Z. Steinberg chairman of the board. The consolidation will permit Hoyne Iron to expand its operations in the nonferrous scrap field.

Coke Ovens Hold Interest

Rebuilt coke ovens in U. S. Steel Corp.'s American Steel & Wire Division, Cleveland, are the center of interest for AS&W officials. At left, John E. Allen, general superintendent, Central Furnaces & Coke Works, points out features of the 45-oven battery to Emmett A. Brady, Coke Works superintendent; F. R. Buskirk, special assignment engineer and Harry Jenter, assistant manager of operations, Cleveland district.

Scaife Opens Oakmont Building

Scaife Co., Pittsburgh, is celebrating its 150th anniversary this year. It was observed in connection with the formal opening of its new office building in Oakmont, Pa. Alan M. Scaife is board chairman of this steel fabricating company which has grown in father-and-son tradition through five generations of the family.

Vermont Firm To Make Castings

Precision Metal Products Corp., recently organized, will produce gray iron and alloy castings at Swanton, Vt. Shop equipment will include electric furnace facilities.

Parker Appliance Names Distributor

Parker Appliance Co., Cleveland, appointed Palmer-Supply Co., Seattle, as a franchised distributor of its industrial tube fittings and tube fabricating tools.

Rahn Granite Builds Plant Addition

Rahn Granite Surface Plate Co. added a wing to its plant at 641 N. Western Ave., Dayton, O. The firm's research laboratory and offices were moved into the new structure, vacating space now being used for an enlarged stock of finished surface plates. The research laboratory provides for accelerated development work on granite surface plates and other basic precision inspection equipment in granite.

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Hall Planetary Style D Miller.
Gould & Eberhardt 96 H Hobber.
Heald #50 Internal Grinder.
Landis 10x18 Plain Grinder, late type.
Sellers 4T Tool Grinder, motor drive.
Sellers 6T Tool Grinder, late type.
Landis 16 x 72 Plain Cylindrical Grinder.
Brown & Sharpe #12 Plain Grinder, reversing mechanism.
Heald #70A Internal Grinder.
Heald #78 Centerless Internal & Cylindrical Grinder, late type, complete.
Jones & Lamson 8 x 31 Thread Grinder.
Heald 72-A3 Plain Internal Grinder.
Lodge & Shipley 16" x 6' single pulley drive, 12 spindle speeds.
American 16" x 8', 3 SCD, 56" center distance, 1¼" hole in spindle.
Blount Model B-3 Special Application Lathe for Turning, 20" swing, 2⅛" hole in spindle, 54" centers.
Lodge & Shipley 20 x 8, single pulley drive, 12 spindle speeds.
Bradford 20" x 15', 4 SCD, 12' center distance, Loose change.
Gould & Eberhardt 16" Back Geared Shaper.
Gould & Eberhardt 24" Back Geared Shaper.
Gould & Eberhardt 28" Shaper, gear box.
Smith & Mills 32" Shaper, gear box.
Fellows 725 Gear Shaper with Spur Guide.
Fellows 612 Spur Gear Shaper.
Brown & Sharpe 3-26 Gear Cutter.
Oliver Template Tool Bit Grinder.
Lodge & Shipley 16" x 12½" centers G.H. Lathe, Timken bearing, complete with taper attachment, late type.
Niles 48" x 48" x 16' Double Housing Planer, 4 heads, box table, DC reversible drive.
Landis 26" x 168" Plain Cylindrical Grinder.
American 30" x 14' G.H. Lathe, 12 speed.
Monarch 24" x 12' G.H. Lathe, complete with 22" 4 jaw chuck and taper attachment.
American 36" x 40' Lathe, Internal Face Plate Drive, with 4" raising blocks, 33' center distance.
Pond 42 x 42 x 10' Double Housing Planer, DC motor drive, 4 heads.
Pond 84 x 84 x 16' Double Housing Planer, DC motor drive, 4 heads.
Cincinnati #2 Centerless Grinder.
Cincinnati-Bickford 4'11" column Radial drill, gear box on base.
Pines Hydraulic Bender, 1½" capacity.
Peerless 6 x 6 Universal Shaping Saw.
Wickes Model 3JR Rotary Surface Grinder, 12" magnetic chuck, late type.
Baker #217 Upright Drill Press.
Gisholt 11 Saddle Type Turret Lathe with bar feed, late type.

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Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Hoppers, All-Steel, 70-Ton, Cross Dump
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An old and well established Company serving the North Central States' area with fabricated and erected structural steel offers a responsible position to an experienced and capable estimator-salesman. Prefer graduate engineer, 35 to 45 years of age, with a considerable and successful background in this type of work. Replies should include full particulars as to age, education, experience and marital status. Correspondence will be held confidential and interview arranged for if qualifications warrant. Write Box 604, STEEL, Penton Bldg., Cleveland 13, Ohio.

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SUPPLY HOUSE IN PITTSBURGH HAS capacity for added lines. Three direct salesmen covering foundries and steel mills in Ohio and Pennsylvania. Present suppliers know of this ad. Warehouse space for rent also available. Address Box 606, STEEL, Penton Bldg., Cleveland 13, Ohio.

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Small Cutting Tool Business

A small business engaged in the manufacture of special machine knives, having the necessary machine tools, patterns and dies is available for sale. This line of tools would be a good addition to an established tool company. We are interested either in selling as a unit or in securing additional capital to further develop this line. Write Box 592, STEEL, Penton Bldg., Cleveland 13, Ohio.

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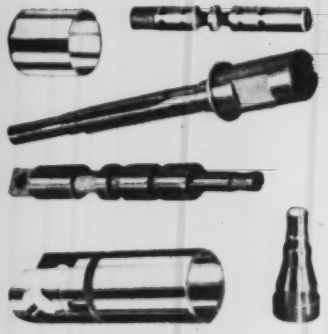

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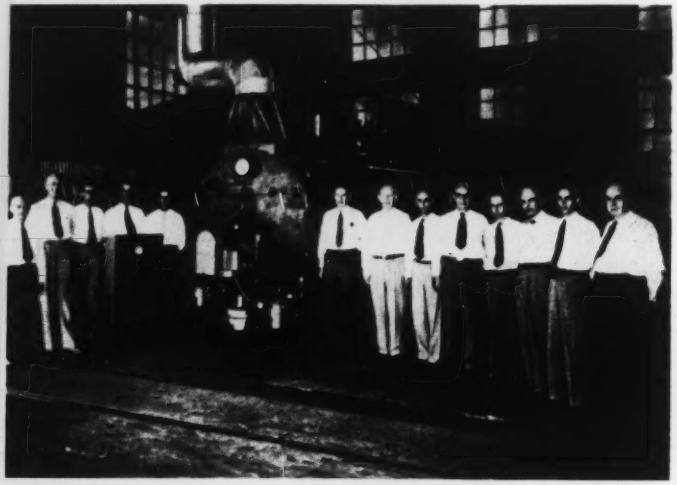

Joint Effort Produces Boiler-Burner Unit

Kewanee-Ross Corp., Kewanee, Ill., and Iron Fireman Mfg. Co., Cleveland, merged engineering and manufacturing resources in production of the new Kewanee-Iron Fireman Boiler-Burner. Above, executives of the companies stand beside the unit, which is available in models for oil, combination oil-gas and gas. Kewanee assembles the boiler portion while Iron Fireman Mfg. Co. manufactures the burner

Delanium Carbon Opens New Plant

Delanium Carbon Corp., New York, opened its factory at Morton Grove, Ill. The new facilities are being used to produce graphite cubic heat exchangers and later will be used also to produce absorption and scrubbing towers and other graphite products for the chemical, metallurgical and process industries. The corporation is jointly owned by Great Lakes Carbon Corp. and Powell Duffryn Carbon Products Ltd.

Reliance Electric Moves Branch

Reliance Electric & Engineering Co., Cleveland, manufacturer of motors and motor drives, moved its Newark, N. J., sales office to larger quarters at 535 High St. Elwood H. Koontz is branch manager.

Airplane Parts Plant Opened

Western Sky Industries is operating its manufacturing plant in Hayward, Calif., and has begun shipping center wing sections for the Navy's attack bomber, the AD Skyraider. Ground was broken for the plant ten months ago.

Drum Making Facilities Moved

Southern States Iron Roofing Co. moved its entire drum manufacturing facilities from Savannah, Ga., and Hattiesburg, Miss., to Birmingham. The new plant will have an eight-hour capacity of 2400 drums. W. H. Nicholas, formerly Houston plant manager for Rheem Mfg. Co., is manager of Southern's Birmingham plant.

Bell Aircraft Activates Plant

Bell Aircraft Corp., Buffalo, announced activation of its newly-acquired plant in Niagara Falls, N. Y., with the transfer of a guided missile production department to the facility. Three manufacturing departments now located in other Bell plants and employing about 350 workers will be moved to the new location which formerly housed Niagara Wallpaper Co.

Caterpillar Tractor Builds Plant

Caterpillar Tractor Co., Peoria, Ill., is constructing a plant at York, Pa. It will consist of a manufacturing building, containing 433,000 sq ft of floor space, a heating plant and office building.

Polymer Appoints More Distributors

Polymer Corp., Reading, Pa., opened three additional stocking points for distribution of its line of nylon and Teflon rod, strip, tubing and slabs. The new distributors are: Black & Webster Inc., Newton, Mass.; Van Cleef & Co., Branford, Conn.; E. Jordan Brooks Co., Los Angeles.

Baker Steel & Tube Co. Expands

Baker Steel & Tube Co., Los Angeles, is constructing a warehouse which will double the size of its present facilities. Mr. R. Mulholland is president while J. P. Boore is general manager.

From The Detroit News—July 26, 1952

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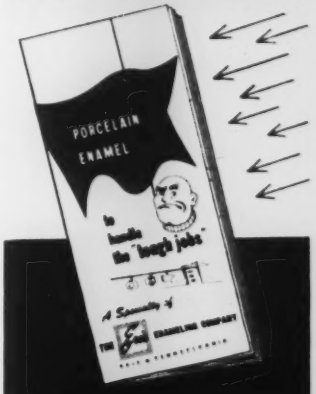

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New "Graph-Mo Hollow-Bar" combines the faster machining and longer wear of Graph-Mo with the economy of a hollow bar section

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- Machines 30% faster
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ADVANTAGES OF HOLLOW BARS

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THE Timken Company announces a new product—"Graph-Mo® Hollow-Bar"! It gives you all the advantages of Graph-Mo tool steel, *plus* the advantages of a hollow bar section.

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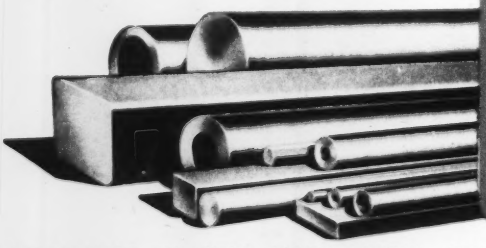

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